

JANUARY 16, 1937

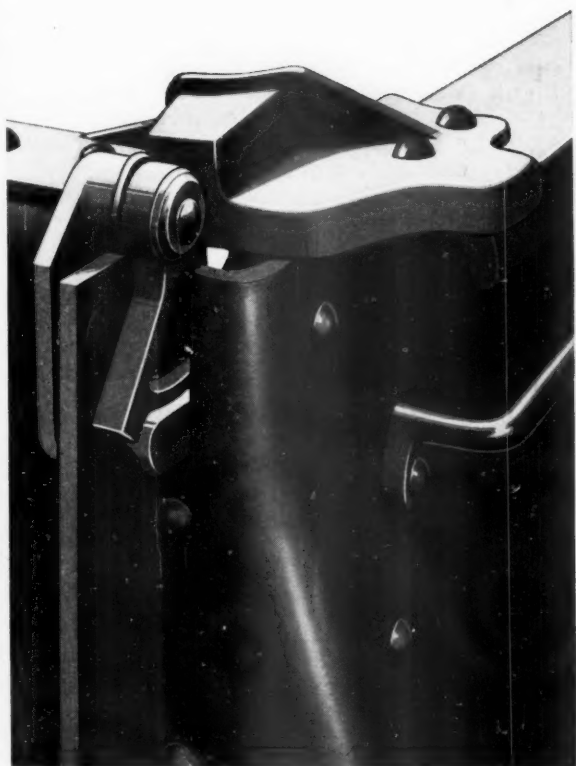
JAN 19 1937

Railway Age

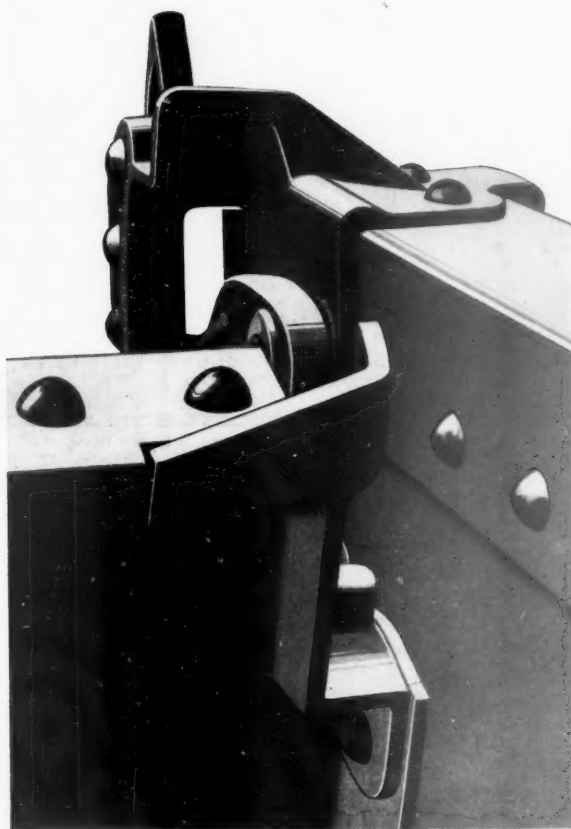
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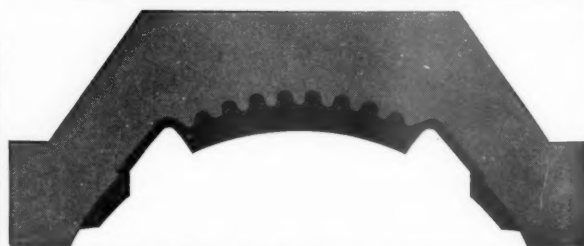
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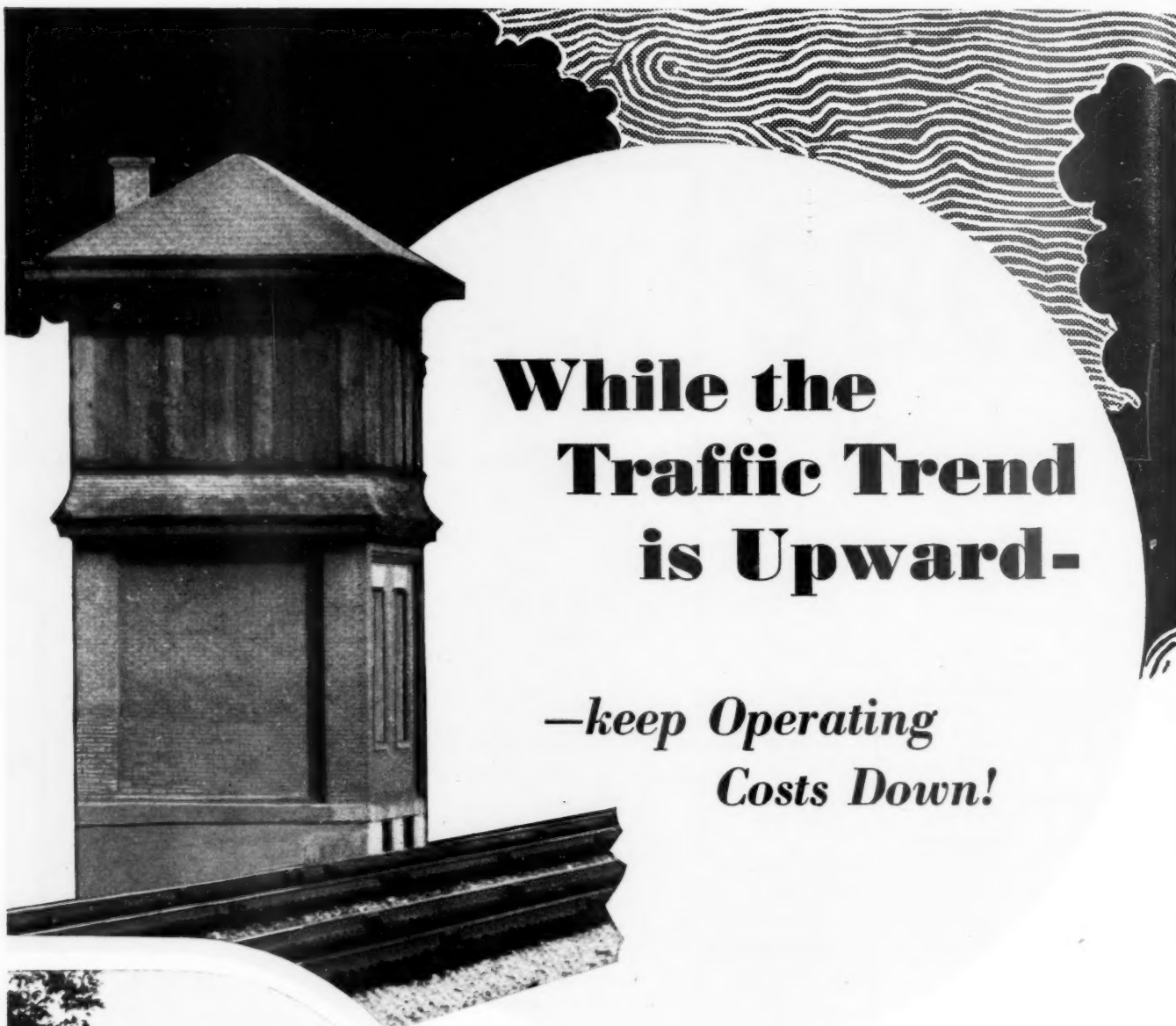
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Engineering Index Service



While the Traffic Trend is Upward-

*—keep Operating
Costs Down!*



Many temporarily closed interlocking plants throughout the country are being reopened because of increased traffic. Before making such restorations it will pay to consider replacing such plants with power switch machines and signals, controlled by "Union" Centralized Traffic Control from a distant location. The tower may be used for housing the field equipment. The changeover will effect operating advantages and savings that will quickly liquidate the small installation cost. » » » »

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The Week at a Glance

CARLOADINGS: Freight cars loaded in the week ended January 2 totaled 588 thousand, which was 8.5 per cent above the corresponding 1936 week and 18.2 per cent above that week in 1935.

1700 FREIGHT CARS: The orders for new equipment reported in this week's news columns total 1700 freight cars, 7 passenger cars and 2 locomotives. New inquiries are shown for 2,200 freight cars.

MORE MONEY FOR I.C.C.: The Interstate Commerce Commission asked for \$1,300,000 additional appropriation on account of its motor carrier regulation work, but the President's budget estimate pared this down to 750 thousand. The net increase in the appropriation asked for the I.C.C. is 693 thousand.

PENSION PARLEY: Representatives of the A.A.R. and the railway labor executives met last week, as suggested by the President, to discuss a possible solution to the question of railway pensions. No final conclusions were reached at the initial meeting but conferences will be continued, and it is expected that they will embrace other matters besides pensions.

AIR CONDITIONING STUDY: The Division of Equipment Research of the A.A.R. has made public an intensive study of air-conditioning systems and their comparative costs. On October 1 last there were 8,031 air conditioned cars in service in the U. S. and Canada and more than half of these were Pullmans. Cost per car-mile is greatly reduced when car-mileage and train speed are increased and cooling season is long. Questionnaire to passengers shows them virtually unanimous in agreeing that: "This beats driving a car."

LOS ANGELES STATION: The ten-million-dollar structure of mission-style architecture is beginning to take shape in Southern California's metropolis—roads participating being the Santa Fe, the Southern Pacific and the Union Pacific. The structure has some novel features which are disclosed in an article herein.

EQUIPMENT MONEY BARGAIN: The Wall Street Journal predicts that the proposed Burlington 2 per cent 15-year equipment trust issue (\$7,000,000) which is expected to be offered at competitive bidding on January 25 will bring a new low in the interest cost of this class of loans. "If the Burlington issue goes over as successfully as is expected," says the Journal, "it will doubtless induce other railroads to come forward with their programs without unnecessary delay."

BIG SALARIES: Time was when any such disclosures as those of business executives' salaries, made in Washington last week, would have shown at least a few railroad executives in the higher brackets, but not so any more. Scarcely any rail-

road leaders, the listings disclosed, now receive the stipends paid by the automotive industry even to its second and third string chiefs. And—as is pointed out editorially herein—while one lady running a corset business gets a salary which most railway executives would envy, still another whose role is the wearing of such finery in parade on the cinema screen, earns as much as a half dozen of the highest paid railroad heads. Go West, young man, if your principal ambition is big money—but stay out of railroading.

REGULATE R.R. CUSTOMERS?: Many railroad patrons are large industries which control the prices of their products and set them arbitrarily at what they think "the traffic will bear." Many of them have recently increased the prices of their products. Having done so, they then appeal successfully to the I.C.C. to force a reduction in railroad rates. The leading editorial in this issue raises the question of the logic and economic justification of this strange public attitude toward the railroads, which is shared by a large section of "big business," namely that the latter may boost its prices as it sees fit while at the same time demanding, and getting, by enlisting government aid, reduced rates from the carriers.

CHARLES HAYDEN: The eminent private banker, head of Hayden, Stone & Co., who was chairman of the board of the Rock Island and a director in many companies connected with transportation, died last week in his sixty-seventh year. This week his will was filed for probate in New York, disclosing that his fortune, estimated at 50 millions, had been left to form a foundation, the trustees of which are given virtually a free hand in expending its revenues for "the education of boys and young men, especially in the advancement of their moral, mental and physical well-being."

2,400 LOCOMOTIVES: J. M. Symes, vice-president (operation and maintenance), A.A.R., testifying in the rate revision case before the I.C.C. last week, gave estimates as to the railroads' need for revenue in order to finance the purchase of necessary new equipment. On cross-examination, he stated that a 5 per cent traffic increase in 1937 would require 800 additional locomotives and 60,000 cars; and that a 15 per cent increase would call for 2,400 locomotives and 180,000 cars.

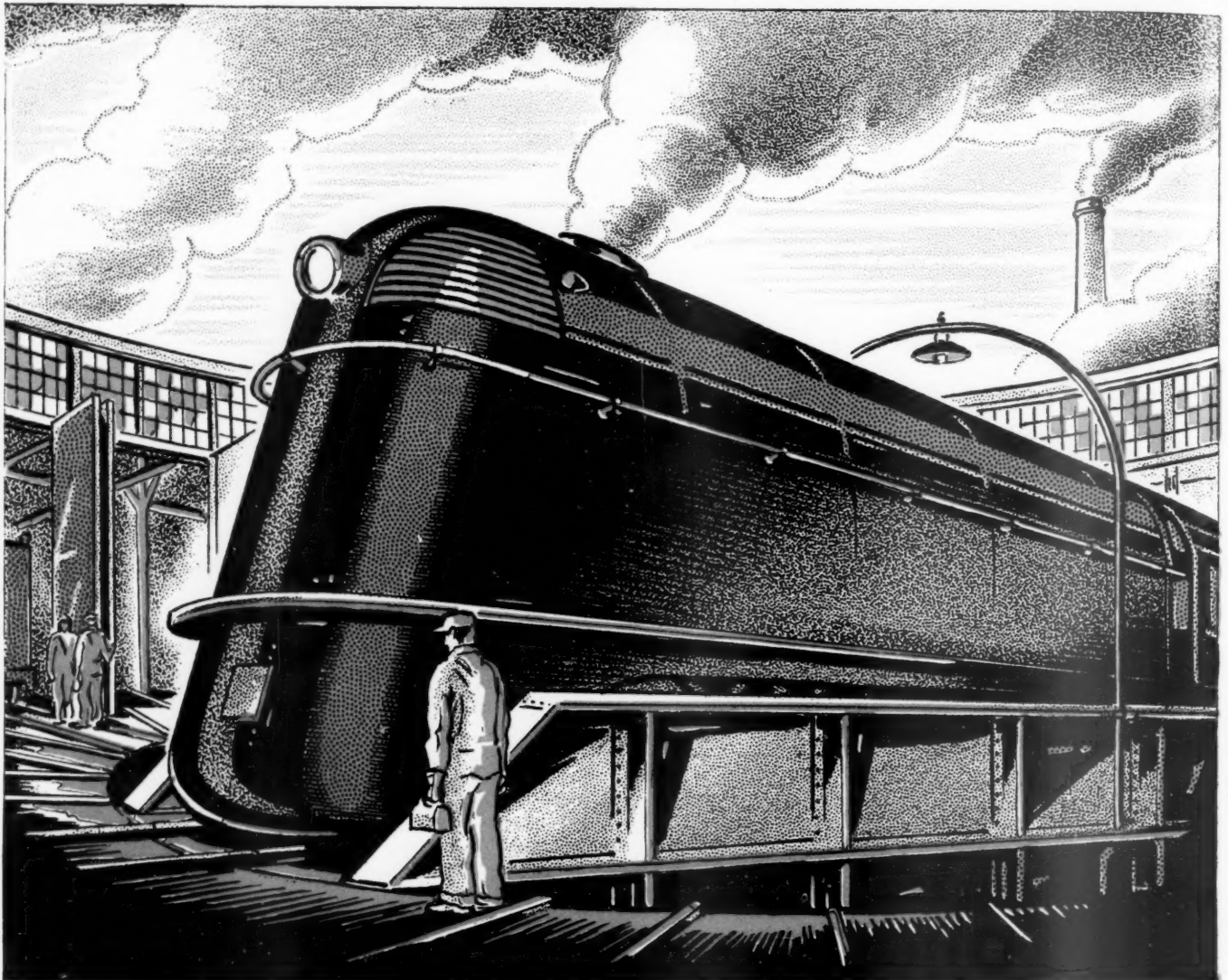
ASLEEP AT THE WHEEL: An editorial herein discusses a recent pamphlet on "driver asleep" accidents published by the National Safety Council. Although trucks are only one-eighth of total motor vehicles, they are responsible for one-third of all "driver asleep" accidents. The Safety Council establishes a definite connection between accidents of this kind and the long hours which truck drivers work; and their general disobedience of the state laws limiting hours of service.

HIGH SPEED ENGINES: Since stresses increase as the square of speed, higher locomotive speeds have given equipment engineers some problems to solve in order to maintain smooth riding and reduce stresses, both in the machines and in the track. Alco's chief mechanical engineer in an article herein shows how these problems are being solved on new high-speed power, by methods which can also in many cases be applied to existing engines.

I.C.C. TO GET BOOT?: Under the President's proposed reorganization of the administrative branch of the government the various independent and "irresponsible" regulatory commissions (among them the I.C.C.) would be brought under the wing of some Cabinet member. There they would be stripped of their administrative functions, which would be taken over by the department to which they were assigned, leaving them solely their judicial functions, perhaps also acting as courts of appeal from disputed administrative decisions. But apparently all transportation, according to the plan, is not to be dealt with in one department—the Bureau of Public Roads and the Army Engineers would not come under the Commerce Department with the railroads.

UNIONS COME OF AGE: A public demand is arising for more responsible unionism in America, with sufficient government supervision to rule out labor "rackets" and dictators. This demand, as an editorial herein points out, is not coming from anti-union sources, but from newspapers which are supporters of the New Deal and among the staunchest friends of organized labor, such as the New York Daily News and the Scripps-Howard papers. The purpose of the suggested reforms is not to weaken organized labor but to strengthen it, by giving it greater social responsibility, eliminating practices which lower its standing in public esteem.

RATE RULINGS PIECEMEAL?: The I.C.C. has taken under consideration an A.A.R. proposal that it render its decisions in the rate revision case, Ex Parte 115, by groups of commodities instead of treating the whole proceeding as a single case. If the Commission is convinced that revisions are justified in a certain group of commodities—then, the plea is, give the railroads the benefit of that opinion as soon as it is reached. The A.A.R. (with Judge Fletcher as spokesman) wants first to clean up all the testimony pro and con on coal and coke, iron ore, iron and steel, cement and petroleum products—starting that batch through the Commission's mill toward a decision; then following with other groups of commodities in turn. This is the modern "production line" method which has proved so successful in other mass production industries—why not in the I.C.C.?



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Anomalies in the Public's Attitude Toward the Railways

At the insistence of a predominant majority of the vocal element among shippers, the Interstate Commerce Commission last month refused to continue the emergency freight charges. Now, at the hearings on proposed freight rate revision in Washington, representatives of the same shippers are opposing any changes calculated to increase transportation charges. At the same time, virtually all of these shipping interests are raising the prices of their own products to the public. Why, in the name of common fairness, should railroad rates be forced down at the very time when other prices are on the way up, and when these self-same shippers, when they sell their products to the railroads, are raising the prices they charge for them?

Commodity Prices Up, Freight Rates Down

Shippers, aided and abetted by the regulatory authorities, seem determined to perpetuate a freight rate policy which is economically unsound and which injures, not the railroads alone, but the functioning of the economic machine as a whole. To maintain equilibrium in our national economy, freight rates ought to advance when the general price level advances and decline when prices decline.

The increasing severity of both upward and downward swings of the business cycle is attributed by most authorities to the growing proportion of commodities and services with "inflexible" prices, i. e., prices which do not go up or down proportionately with the general price level. Freight rates on the average did not decline as much as general prices during the depression. If they had done so, many railroads would not have earned their operating expenses. But neither did freight rates rise with the general price level in 1919-20 and during the "boom." Had they been permitted to do so, with the understanding that reserves were to be built up for lean years, it would have been possible and justifiable to have reduced rates to a considerably lower level during the depression than was found possible. Higher rates during the boom would have helped to some extent to curb its excesses, just as lower rates during the depression would have tended to make the valley shallower. But the roads, not having been allowed to accumulate fat as unregulated industries were, could not make the concessions that otherwise might fairly have been asked of them—and still continue to function.

Now, with commodity prices rising, there is as yet no indication on the part of either the shippers or the regulatory authorities of an understanding that a rising price level can absorb some increases in freight rates without harm to anyone. If the railroads are not allowed to maintain a rate level which will permit them to earn a fair return in a time of rising prices and improving business—then when can they ever hope to earn such a return?

Why Regulate Railroads and Not Other "Big Business"?

There is no longer a monopoly in transportation. While the economic life of the country would suffer greatly from a suspension of railroad service, it would not cease entirely—as it might have done 25 years ago. Under present conditions railroad service, by itself, is no more "affected with a public interest" than is the manufacture of automobiles, or the production of steel or coal. People in many parts of the country would quickly starve if *all transportation* were tied up—so transportation as a whole is "affected with a public interest," and there is logical reason for some public regulation of transportation insofar as it is taken in as a whole. But there certainly is no reason in justice or the public interest for concentrating virtually all regulatory attention on but one part of the transportation machine.

Why, in the public interest, are pensions required for railway employees, but not for employees of motor lines, ships and airplanes? Why an elaborate labor relations law on the railroads, but none for motor and water lines? Why agitation for the six-hour day on the railroads when motor and water lines do not even have the eight-hour day, which was generally established on the railroads almost two decades ago?

Why a long-and-short haul restriction on the railroads, with none on other forms of transportation? That restriction has not prevented the Pacific Coast from getting lower rates than are available in Inter-mountain territory. Does the restriction protect the public interest, or is it not rather merely a vestigial remnant of an organ which formerly served a useful function?

The fact is that not alone the regulatory authorities, but business men and publicists as well, need to re-

examine their attitude on railroad regulation from the ground up. The regulatory process is admittedly costly and admittedly restrictive upon effective managerial action. If, despite these negative characteristics, it produces positive advantages in the public interest, more than sufficient to offset them—then it is justifiable. But, in the light of developments of the last decade and a half, how many of the restrictions of the Interstate Commerce Act, *as long as they apply to the railroads alone*, actually serve any useful purpose commensurate with the harm they do?

Higher Prices Cancel Effect of Lower Rates

In this connection we have already mentioned that useless and diseased appendix, the long-and-short haul clause. But why also, pray, should we have Commission-fixed maximum rates on commodities the producers of which arbitrarily set *their* prices at any point which they believe will yield them the maximum profit? What public interest is served by removing the freight surcharge (when the railroads' rate of return proves the rate level to be not unreasonable) on commodities, the prices of which are at the same time being arbitrarily increased more than enough to offset the freight rate reductions? The Commission, in removing the emergency charges, apparently believed that the reduction might stimulate traffic and revenues. But how can this be if commodity price increases are simultaneously made which absorb the rate reduction, and then some? Under such conditions the consumer has no more price incentive to order goods than he had before—and it is the consumers of goods, and not the producers, who determine the volume of freight traffic.

And why should overexpansion of railway plant be so carefully guarded against by the requirement of certificates of convenience and necessity, while transport plant in the form of highways and waterways is added to constantly with no consideration whatsoever of the public convenience and necessity, nor the adequacy of existing facilities?

The fact of the matter is that, except as transportation is regulated as a whole and not in part, it would be mighty hard to find any more reason for regulating the rates and investment and employee relations in railroads than in the manufacture of automobiles, or steel, or cement, or lumber or chain stores or non-ferrous metals, or any other industry where large concerns predominate. When large industry consents to over-regulation of the railroads and enlists regulatory support to secure lower rates than the railroads believe they should pay, they are simply assenting to a principle which could with equal justice and logic in the public interest be applied to them.

Large Salaries—But Not on the Railroads

In the Congressional disclosures of large salaries in industry last week, a microscope was needed to detect the few railway executives who qualified among the

number. Far more entitled to financial reward in the eyes of the public, apparently, than a man who by his integrity and severe self-discipline has kept intact the spirit and performance of a great transportation machine is a lady attractive to the eye who cordially invites us "up to see me sometime"—or any one of a number of low comedians. Selling undies to the ladies is apparently so profitable that some concerns engaged in that business can afford to pay their executives far more than huge railroad corporations do. A keyhole columnist for a daily newspaper gets over \$60,000. Two piano salesmen make over \$50,000 each and a lady heading a corset business receives a stipend of over \$57,000. No business in any way approaching the importance or the complexity of the railroads was disclosed which paid its executives much less than two or three times the maxima received by railway executives.

It is fortunate that there are compensations in railroad managerial work which transcend the money income—compensations of a difficult task brilliantly done which are comparable to those of the underpaid scientist or artist. At the same time, money rewards cannot safely be entirely ignored. When one motor company pays—not one executive alone, but a half dozen or more—salaries which are three to six times as much as the maximum paid to the chief executive of any railroad—then wherein lies the incentive for capable young men to enter the railroad, rather than the motor, branch of the transportation industry?

Hours of Service In Truck Transport

The National Safety Council has just published a 32-page illustrated pamphlet entitled "How Long on the Highway," which is an analysis of accidents resulting from drivers falling asleep at the wheel. One in three of accidents due to this cause involve trucks—although trucks represent only one-eighth of registered vehicles. Reported accidents with "driver asleep" as the cause killed 730 persons and injured 4,700 in 1935 but, the Safety Council says, actual cases arising from this cause "were doubtless twice, probably 3 times, and possibly 4 or 5 times as many as reported."

Motor trucks are on the highway not as a matter of right, but as a privilege. Persons enjoying a privilege ought to be required at least to take reasonable precautions to avoid killing and maiming people in their enjoyment of it—or else the privilege should be withdrawn. The National Safety Council's survey shows how little effort the truck operators are putting forth to keep sleepy drivers off the roads. According to its count, "one (truck driver) in every 3 is at the wheel for more than 8 hours without any rest; 1 in 5 is on duty continuously for more than 12 hours; and 1 in 5 is awake more than 16 hours when his driving ends."

That there is a close connection between long hours of work and truck accidents is shown by the fact that of trucks involved in such accidents the drivers in 9 out of 10 cases had lacked proper sleep during the preceding 48 hours. But mere "regulation" of drivers' hours, without proper enforcement or adequate penalties, the survey discloses, is no solution since "more than half the truckers entering states which 'regulate' hours will have violated those regulations when their driving ends."

Doubtless the enlightened element in the truck business would be quite willing to see these inhuman and dangerous working conditions ameliorated—but whether truckers want such regulation or not, it is evident that the public has a stake in the situation which cannot be overlooked. A sleepy driver is in many respects as much a menace as a drunken one. The states appear to be making headway with the drunken and reckless driving problem, not by the imposition of nominal fines, but by suspending or canceling licenses to drive. Some such method might bring better enforcement of the truck drivers' hours of service laws, with care to see to it that the penalty falls on owners who require long hours and not on drivers, where they are not responsible.

Responsible Unionism

It is a matter worthy of more than passing interest that the "liberal" Scripps-Howard newspapers have begun the publication of a series of articles on labor union responsibility in Britain—where, it is stated, union accounts are made public, unions are "registered" (equivalent to incorporation), and "union rackets" are virtually unknown. The Scripps-Howard newspapers have been uniformly friendly to legitimate trade unionism, while at the same time giving battle to "labor rackets." The strongly pro-New Deal New York Daily News has likewise criticized the anomaly whereby union contracts are enforceable upon the employer but not upon the labor union.

It is an unfortunate fact that, speaking generally, industrial employees cannot depend upon the generosity of their employers to assure themselves of fair treatment, and that organization—or at least the possibility

of it—is necessary as a corrective of genuine evils. At the same time, do not the rank and file members of the unions also need some protection, which they do not now have, against dictatorship by their own leaders? When an administration comes to power in a labor organization, it also secures control of the election machinery—and, once in the saddle, it usually stays there until somebody dies.

This is the same sort of thing as if a political party, once in power, were able to control all future elections and expressions of opinion for the country as a whole. It is the method of Hitler or Mussolini, rather than that of democracy. Meeting a need plainly indicated by organized labors' warmest friends in journalism, F. J. Lisman, New York financier and publicist, has proposed several reforms among which are the following:

1. That unions be required to incorporate so that they may be held to the performance of their contracts.
2. That elections be supervised by an impartial government body, to assure decisions in conformance with acknowledged democratic principles, avoiding dictatorship.
3. That accounts be audited and publicly reported as in the case of business corporations.

It is to be said to the credit of the railway labor organizations that little of the "racketeer" tactics so familiar with some urban labor organizations has developed among them. They have, by and large, lived up faithfully to their contracts even when it was difficult to hold some of their members in line (as in the post-war "outlaw" strikes). They would probably have little to fear either from publicity of accounts or from a requirement that they incorporate, while legislation to this end would curb racketeering unions which give the whole labor movement a black eye. Supervised elections would also remove a great cause for internal dissension, and hence promote harmony within the organizations, since present arrangements give "sore-heads" an opportunity to complain which they would lack if the fairness and honesty of all balloting were above question.

Organized labor has achieved manhood's estate. It is not too much to ask it to accept manhood's responsibilities, and to prepare to grow in public esteem as it fulfills them.

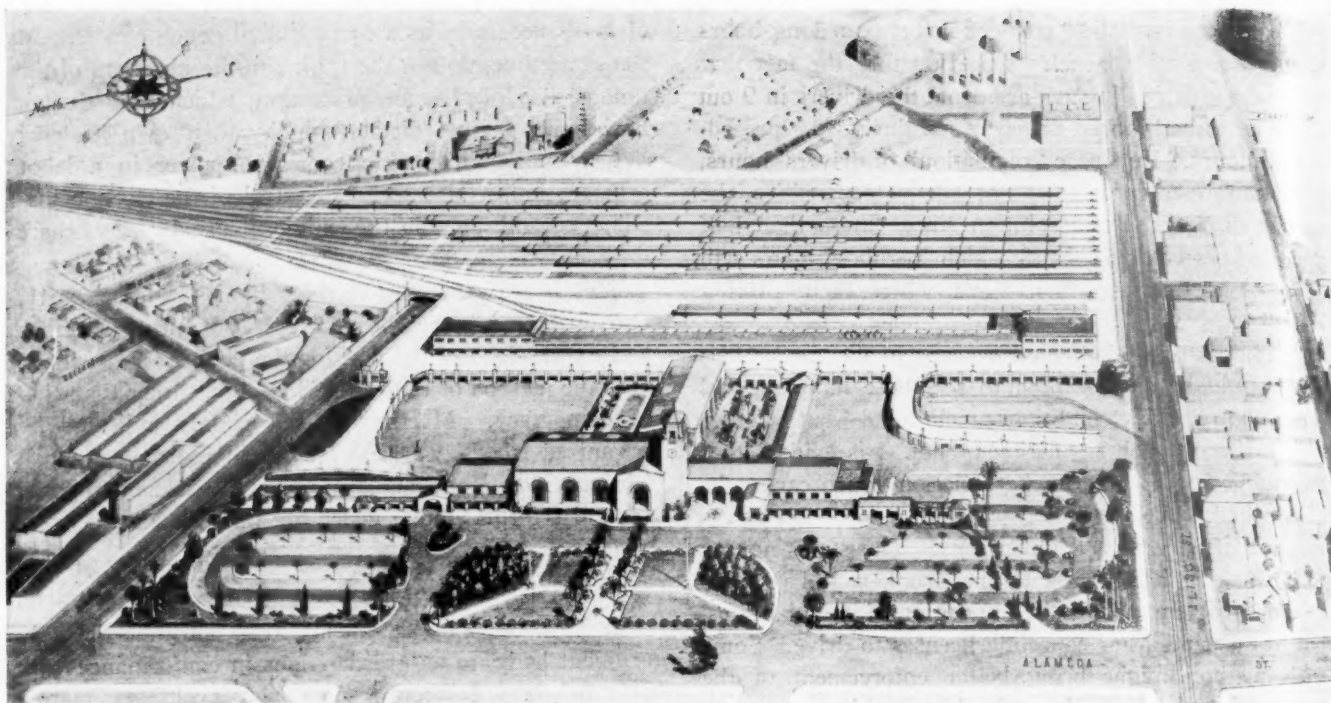
Restoration of Farm Price Ratio Big Aid to Recovery

Unquestionably the rise in staple commodity prices has been one of the most important developments of 1936, and one holding great promise for 1937. The advance in farm products and other raw materials during the twelve months has averaged around twenty-five per cent . . . Farmers and other producers of raw materials will have the first benefit, for they will receive higher prices, and also will probably be able to sell more; but the resulting increase in purchasing power, if not absorbed by rises in industrial

prices and costs, will flow around the circle, creating business for everyone. . . .

The re-establishment of balanced price relationships in these areas has been one of the chief gains of 1936. It makes improvement in both domestic and world trade possible; and as long as the equilibrium is maintained there will be no good reason why recovery should not carry on, without more than normal fluctuations, to full employment of the country's productive capacity.

From the Economic Bulletin of the National City Bank (N. Y.)



Architect's Drawing of the Proposed Union Station and Auxiliary Facilities

Los Angeles Soon to Have New Union Station

With design and layout of head house, approved building work in progress and grading practically complete, new terminal is taking definite form

DEFINITE progress is being made on the Union Station at Los Angeles, Cal. The grading for the station tracks is substantially complete, the site for the approach tracks is being cleared of existing buildings, construction is in progress on a baggage, express and general utility building, and the plans for the head house are rapidly taking final form.

The station is being constructed as a joint facility by the Atchison, Topeka & Santa Fe, the Southern Pacific and the Union Pacific, to replace the Santa Fe station at Santa Fe avenue and First street, and the Southern Pacific station on Central avenue and Fifth street, which is used also by the Union Pacific. The new station will occupy an area, approximately square in shape, and roughly 1,200 ft. each way, on the east side of Alameda street between Aliso and Macy streets, that had been acquired by the Southern Pacific through purchase of the El Paso & Southwestern, which had bought it for use as the terminal of a projected Los Angeles extension.

The site has the advantage of proximity to the lines of the participating railways; the center of the station

track layout is only about 3,900 ft. (rail route distance) from the point where the Southern Pacific line to El Paso crosses the Los Angeles river, the two banks of which are occupied, respectively, by the Santa Fe and the Union Pacific. Wye connections at this common point afforded the necessary junction of the lines of the three roads with the approach line to the station.

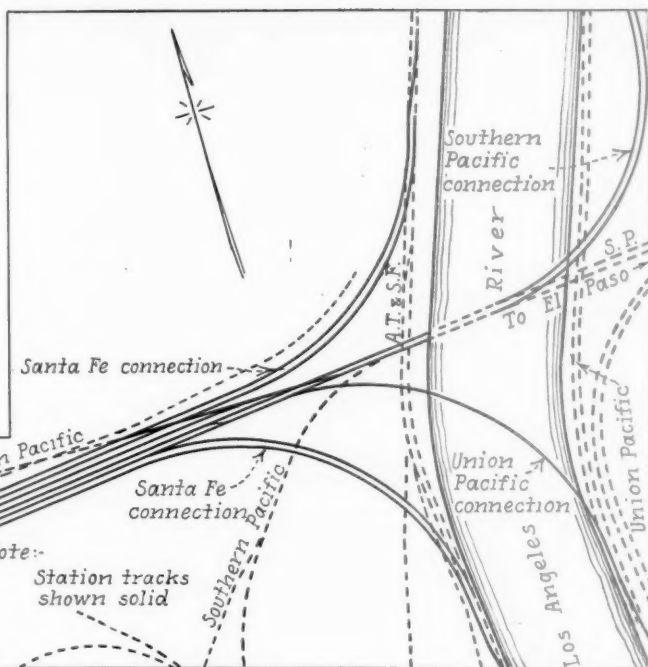
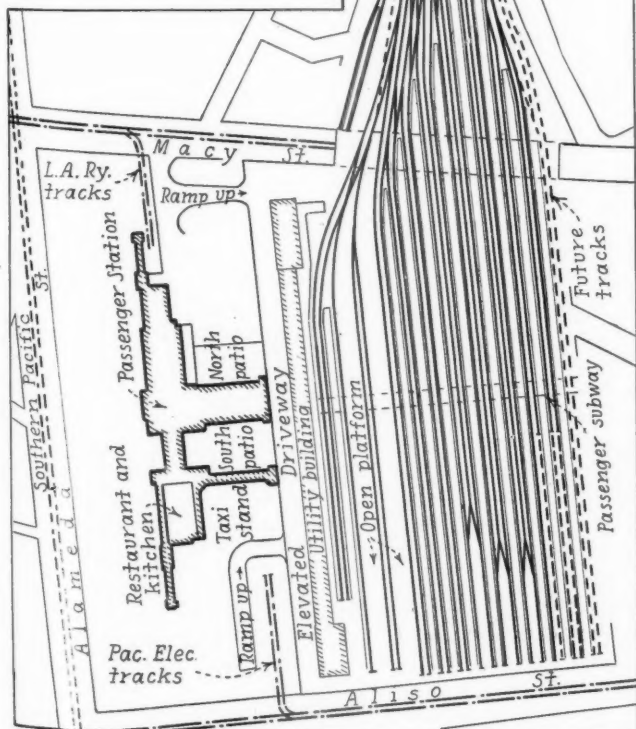
Proposed several years ago by certain interests in the city that desired to make the station an important element of a civic center at the so-called Plaza location, the project was the source of protracted litigation. However, after an order of the Railroad Commission of California was upheld in a decision of the state supreme court which was sustained by the Supreme Court of the United States on May 18, 1933, the railroads made application to the state commission for the approval of a station plan. In this application the railroads accepted the offer of the City of Los Angeles to appropriate \$1,000,000 for the grading of the site and certain funds for grade separations. Acceptance of this plan by the commission embodied a division of the interests of the participating railroads, assigning 23 per cent to the Union Pacific, 33 per cent to the Santa Fe and 44 per cent to the Southern Pacific.

A Unique Plan

The necessary location of the approach with respect to the station site is such as to require that the platform tracks be located parallel with the head house frontage, and for this reason studies were made for a through or

double-approach type of layout. But this plan did not prove acceptable to all parties at interest, with the result that the plan adopted provides for a station of the stub-end type but with the head house alongside instead of at the end of the platform tracks. This arrangement necessarily calls for a two level plan, with the tracks at a sufficient elevation above the station floor to permit of a passenger subway under the tracks, with ramps to platform level.

A unique feature of the plan, in this connection, is the placing of a long, narrow two-story utility building between the track layout and the station building proper to house the baggage and express facilities, railway mail room, boiler room, employees' locker rooms, etc. Less than one-half of the width of this building is two stories high, the roof of the one-story width serving as a driveway, with ramps to the street level near each end. As a result all express and most baggage will be handled to and from tail-board space at the track level, thus obviating the use of elevators. However, baggage storage space and a receiving and delivery platform are being provided also at the lower level for the handling of baggage coming to or leaving the station in private automobiles or taxicabs. Provision will be made later for the handling of United States mail in connection with a project for a new general post office, which will occupy a site yet to be selected in the immediate vicinity of the terminal.



Plan of the New Union Station Layout at Los Angeles, Showing Connections With the Participating Lines

It was agreed from the start that the architectural design of the station must be truly expressive of Southern California, which necessarily implied an adaptation of what is variously designated as mission, Mediterranean, etc. And to carry out this idea with any degree of effectiveness demanded a spacious site that would afford the open vistas without which the architectural effect would be meaningless. To this end, the space allotted to the head house embraces the entire width of the block between Macy and Aliso streets, about 1,200 ft., to a depth of 475 ft. from the east side of Alameda street. This makes it possible to set the face of the station building back some 200 ft. from the street. However, entirely aside from any consideration of esthetics, this arrangement affords ample room for the large parking areas that have become such an essential element in passenger station layouts in recent years.

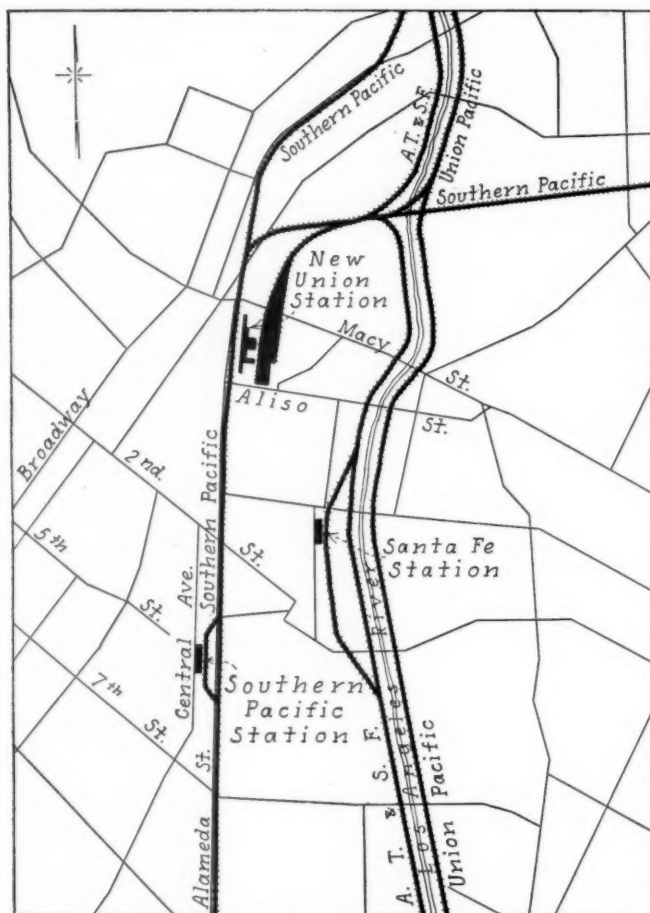
The adopted type of architecture also lends itself readily to a general ground plan and arrangement of facilities whereby a large part of the patrons will for the most part occupy or transverse patios and open arcades while waiting for or departing from trains. The plans call for a rambling structure in the form of a tee, the cross of which is to extend for a length of 850 ft. on the Alameda street frontage, while the stem, which will be occupied by the waiting room, is to form the connection between the principal mass of the building and the utility building that flanks the station tracks.

In keeping with the adopted motif, the building will be of moderate though varying height, that will give emphasis to a tower over the main entrance vestibule near the center of the street front. This vestibule leads on the left to the wing that is to be occupied by the main concourse, ticket counter, rest rooms, etc., and on the right through an arcade to the wing that will house the restaurant, while to the rear, a broad archway will lead to the waiting room. The far end of the waiting room will open into a train concourse on the first floor of the utility building where train gates will give access to the passenger subway under the tracks. This waiting room will be flanked on both sides by patios, the one on the right being designed to serve as the principal route

of egress from incoming passengers, who will pass from the subway through a reception room alongside the train concourse, thence through the patio and the arcade at its outer end to reach the parking area in front of the station, or through an arcade along the south side of the patio that will serve as a taxi stand as well as a passageway during inclement weather. Similar arcades along a large part of the street front will serve the same function for passengers arriving or leaving in private automobiles, while the arcade extension beyond the north end of the building will serve in like fashion for street car riders. A four-track terminal for the Pacific Electric, which operates trains over the city streets, will be provided at the street level adjacent to the Aliso street end of the utility building.

The Track Layout

The track layout calls for eight passenger platforms, of which six are to be constructed at present, to be served by tracks spaced 13 ft. between platforms and 31 ft.



Sketch Map Showing Relative Locations of the Proposed New Union Station and the Present Southern Pacific and Santa Fe Stations

across the platforms, except that three pairs of platform tracks are spaced 26 ft. center to center to make room for engine release tracks between them. The platform tracks will have a capacity of 12 to 20 cars. Plans are being prepared for platform sheds that will have supporting columns at about 80-ft. centers to insure a minimum of interference with the movement of the passengers.

Supplementing the passenger platform tracks, space has been provided between the first platform track and the utility building for six tracks for the loading and unloading of head-end cars. Three of these will be served

by car-floor level platforms, while the other three will be virtually "team tracks" for the direct transfer of lading to and from street vehicles.

The approach line which embraces six running tracks will be on a grade of 0.2 per cent descending toward the station, but the ground level falls away in the same direction to a sufficiently greater extent to provide headroom for the two-level station plan as well as for subways for Macy street and a new traffic way connecting Vignes street and Querolo street.

Construction Methods

The embankment for the station and approach tracks has been made principally from soil taken from building excavations in the city, special pains having been taken to effect a thorough compacting of the fill. The material was placed in layers from six to eight inches thick and so thoroughly solidified with a sheep's foot roller that it is said to occupy 20 per cent less volume than it did in the excavations. This not only insures a solidified roadbed but also warrants the support of the train shed footings directly on the fill. Resort to this practice is possible, however, only because the foundation material at the site—river sand and gravel—is of a character that insures a minimum of settlement. For this reason, also, all of the buildings and other structures will be supported on natural, spread foundations. In a number of cases these consist of cylindrical concrete piers, constructed within curbed wells that are excavated to a depth of 7 to 13 ft. below ground level. These are belled out at the bottom by a unique method that effectively solved the problem of undercutting the sand and gravel, the cohesive properties of which decrease rapidly as they dry out on exposure to the air. When the excavation has been carried to the elevation of the top of the bell, two-inch steel pipes are driven with a Barco gasoline hammer to such a batter that they conform to the shape of a truncated cone of the desired spread. With the upper ends of these pipes supported by a ring-wale, they provide adequate support for the ground as the enclosed material is excavated.

All of the buildings are being designed in conformity with the provisions of the Los Angeles building code covering earthquake-proof construction, which, in general, requires the subdivision of the structures into independent self-supporting units of limited horizontal dimensions. For example, the utility building, which is 1,238 ft. long is divided into seven sections from 60½ ft. to 242 ft. long, with double walls, and expansion joints in the floors and roofs at the adjoining ends of the sections.

This building is of reinforced flat-slab construction to the track level with steel frame construction for the second story. The passenger subway is a reinforced concrete rigid-frame structure.

The project has been developed and is being directed by a committee of executive officers of the three participating railways, which has appointed sub-committees to deal with the various specialized problems. Among these, the board of managers consists of F. H. Knickerbocker (chairman), general manager, Union Pacific, Southwestern district; J. R. Hitchcock, general manager, Santa Fe Coast lines; and A. T. Mercier, general manager, Southern Pacific. The engineering committee is composed of M. C. Blanchard (chairman), W. H. Kirkbride and H. C. Mann, chief engineers, respectively, of the Santa Fe Coast lines, the Southern Pacific and the Union Pacific, while the architectural committee embraces H. L. Gilman (chairman), J. H. Christie and R. J. Wirth, architects, respectively, of the Santa Fe

Coast lines, the S. P., and the U. P. John and Donald Parkinson, Los Angeles, have been retained as consulting architects. A. J. Barclay is construction engineer and S. V. Meigs is assistant construction engineer.

The project will entail an outlay of about \$10,000,000, of which approximately one-half will represent the cost of the physical improvements and the other half the cost of land, property damage, etc.

F. D. R. Would Revamp Regulatory Commissions

WASHINGTON, D. C.

OVERHAUL of the dozen or more independent regulatory commissions in the federal government, prominent among which is the Interstate Commerce Commission, together with other independent agencies, administrations, authorities, and boards, and their location by executive order within one or another of the major executive departments for division into "administrative" and "judicial" sections with a view to maintaining the independence of the latter, is proposed in a report of the President's committee on a plan for governmental reorganization submitted to Congress with a message from the President on January 12. Another plan is expected to be proposed shortly by a special Senate committee which has been studying the subject.

No separate discussion of the Interstate Commerce Commission is included in the report but it is mentioned as the first of the "independent" regulatory commissions which it says would be more accurately called the "irresponsible" regulatory commissions "for they are areas of unaccountability." Presumably the Interstate Commerce Commission would be allocated to the Commerce Department, as has been suggested in several previous plans of this kind, but the report does not go so far into detail, merely proposing the placing upon the Executive of "continuing responsibility for the maintenance of effective organization."

Under this proposed plan, the report says, "put forward as a possible solution of the independent commission problem, present and future, the regulatory agency would be set up, not in a governmental vacuum outside the executive departments, but within a department. There it would be divided into an administrative section and a judicial section. The administrative section would be a regular bureau or division in the department, headed by a chief with career tenure and staffed under civil-service regulations. It would be directly responsible to the Secretary and through him to the President. The judicial section, on the other hand, would be in the department only for purposes of administrative housekeeping, such as the budget, general personnel administration, and materiel. It would be wholly independent of the department and the President with respect to its work and its decisions. Its members would be appointed by the President with the approval of the Senate for long, staggered terms and would be removable only for causes stated in the statute."

Such a plan, it is asserted, "creates effective responsibility for the administrative and policy-determining aspects of the regulatory job and, at the same time, guarantees the complete independence and neutrality for that part of the work which must be performed after the manner of a court."

Several Presidents in the recent past have occasionally displayed some impatience at their inability to co-ordinate

with their own policies the action of the Interstate Commerce Commission as to general rate levels, and the present Executive even went so far, in a campaign address, as to imply some credit for his administration for the reduction in passenger fares ordered by the Interstate Commerce Commission. The report, however, says that in performing important judicial work the commissions "ought to be wholly independent of executive control" and although the word "judicial" is most often used in its text it implies a combination of judicial and legislative phases of the work by saying that "the bulk of regulatory commission work involves the application of legislative 'standards' of conduct to concrete cases, a function at once discretionary and judicial and demanding, therefore, both responsibility and independence."

The report is somewhat vague as to how the line should be drawn between the administrative and judicial functions and as to the extent to which the commissioners would be separated from what is now their organization. For this reason questions have already arisen as to how an attempt to work out such a separation might be made by an administration that has so openly resented the independence of the Supreme Court. In many cases the judicial function is now exercised by commissioners by the process of subscribing their names to or revising work done by subordinates, but under the present practice the subordinates have to some extent at least been selected by the commissioners and the conclusions which they have recommended for adoption have been reached in consultation with and under the supervision of the commissioners. The President's plan apparently leaves open to considerable uncertainty the extent and nature of the questions that would be put up to the independent commissioners for judicial decision by an organization whose policy-determining aspects would be subject to the executive branch.

"These independent commissions," the report says, "are in reality miniature independent governments set up to deal with the railroad problem, the banking problem, or the radio problem. They constitute a headless 'fourth branch' of the government, a haphazard deposit of irresponsible agencies and uncoordinated powers. The independent commission is obliged to carry on judicial functions under conditions which threaten the impartial performance of that judicial work. The discretionary work of the administrator is merged with that of the judge. It is imperative that we discover some technique or principle by which the work done by our present regulatory commissions, together with such new regulatory tasks as arise in the future, may be handled without the loss of responsibility for policy and administration and without the undermining of judicial neutrality."

"The division of work between the two sections would be relatively simple. The first procedural steps in the regulatory process as now carried on by the independent commissions would go to the administrative section. It would formulate rules, initiate action, investigate complaints, hold preliminary hearings, and by a process of sifting and selection prepare the formal record of cases which is now prepared in practice by the staffs of the commissions. It would, of course, do all the purely administrative or sublegislative work now done by the commissions—in short all the work which is not essentially judicial in nature. The judicial section would sit as an impartial, independent body to make decisions affecting the public interest and private rights upon the basis of the records and findings presented to it by the administrative section. In certain types of cases where the volume of business is large and quick and routine action is necessary, the administrative section itself

(Continued on page 152)

Air Conditioning of Railroad Passenger Cars

Abstract of a summary report of extensive road and laboratory tests conducted by the A. A. R.
Division of Equipment Research

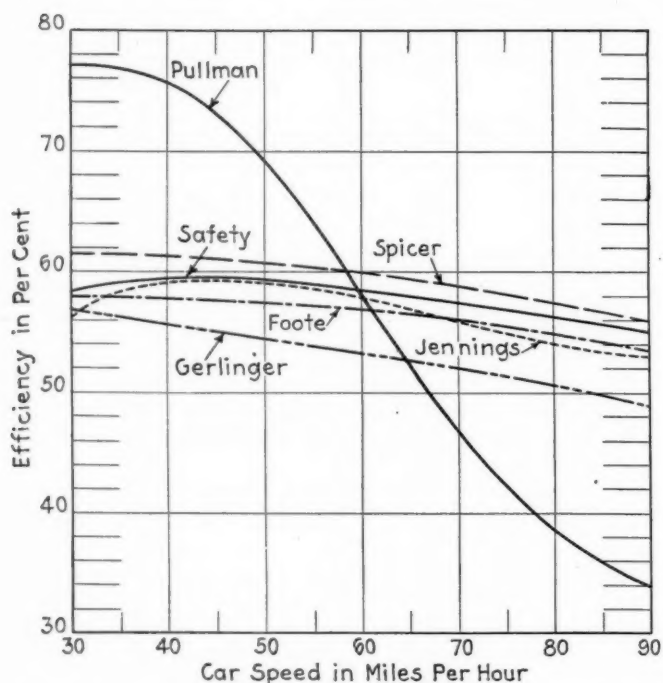
ON OCTOBER 1, 1936, there were 8,031 air-conditioned passenger cars in the United States and Canada, of which 3,907 were railroad-owned cars and 4,124 were Pullman-owned cars. The total investment in the air-conditioning equipment installed on these cars amounts to \$45,000,000.

The number of air-conditioned cars owned by 45 railroads as of March 1, 1936, was 2,653.* This equipment represents a net investment in round figures of \$14,087,000, as shown in Table I. Forty-three of the railroads had an additional net investment in terminal facilities for air conditioning amounting to \$1,157,000, making a total of \$15,244,000.

In view of the magnitude of this investment and the necessity of securing maximum returns from equipment installed now or in the future, the Board of Directors of the Association of American Railroads on December 20, 1935, authorized the Division of Equipment Research to conduct an extensive investigation of the air conditioning of railroad passenger cars.

To accomplish the objectives, the project was conceived as consisting of the following steps: Survey of the per-

* The table (omitted here), in which these cars are classified, shows that 702 have electro-mechanical drive; 423, mechanical drive (Pullman); one, Waukesha internal-combustion drive; 20, head-end electrical drive (articulated trains); 464, steam-ejector system, and 1,043, ice-activated system.



Efficiencies of Car-Axle Drives, Including Generator and Compressor Motor for Electro-Mechanical Drives and Speed Control (Set for 42 M.P.H.) for Pullman Direct Drive

formance of equipment in service; determination of the efficiency of air-conditioning systems; determination of the mechanical efficiency of the drive mechanisms; study

Table I—Net Charge to Investment Account—Air Conditioning Equipment—2,653 Cars Owned by 45 Railroads in U. S. and Canada, as of March 1, 1936

	Number of units	Total amount
Mechanical compression:		
Electro-mechanical drive	702	\$3,922,245.46
Direct-mechanical drive (Pullman)	423	3,481,597.66
Internal combustion engine drive (Waukesha)	1	3,729.76
Head-end power drive (articulated trains)	20	66,275.58
Total	1,146	\$7,473,848.46
Steam ejector	464	3,396,297.02
Ice activated	1,043	3,216,888.41
Total	2,653	\$14,087,033.89
Additional facilities (terminal)		1,157,131.54 (a)
Grand Total	2,653	\$15,244,165.43

(a) Values for two railroads not reported.

of air requirements, treatment, diffusion and related matters; determination of the cost of air-conditioning per 1000 car-miles; and study of the factors relating to passenger comfort.

The study was concerned primarily with railroad-owned cars. This deals only with railroad-owned equipment. However, rather complete information was obtained concerning the performance of the air-conditioning equipment installed on 120 Pullman-owned and operated cars. The findings of this phase of the work will appear in a subsequent report. An engineering report containing full engineering details will be issued, also individual reports to each of the 31 railroads which generously aided in the execution of the research program by providing equipment and experienced men to assist in the road work.

The comprehensive scope of the air-conditioning study is indicated by an examination of Table II. Manufacturers of air-conditioning equipment assisted materially by sending equipment at their own expense to Baltimore, Md., for testing, and co-operated in many other ways. Both the Baltimore & Ohio and the Pullman-Standard Car Manufacturing Company placed at the disposal of the Division of Equipment Research their splendidly equipped hot rooms for testing air-conditioned cars. Ohio State University made available its laboratory for testing mechanical drives and in many other ways was most helpful. The Finance, Accounting, Taxation and Valuation Department of the A.A.R. undertook and completed the very important and tedious study of investment, maintenance and operation charges.

The relative efficiencies of 15 cooling units were determined by laboratory tests, the component parts of each system being tested under uniform conditions, with

inlet air to the cooling coils at 80 deg. F. and 50 per cent humidity.

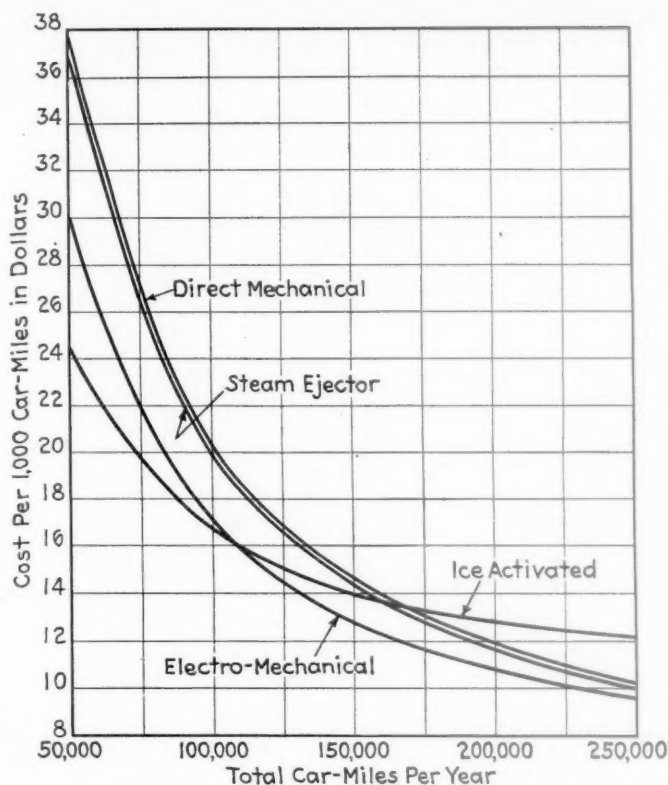
An extremely important factor is the power required by each system, expressed either in the total amount of power used or in the amount of power consumed per ton of refrigeration. For this reason, the power required per ton of refrigeration is the only factor presented in this report.

Mechanical Compression System.—The performance of 9 to 12 mechanical compression systems tested in terms of the power required per ton of refrigeration is shown in Table IV. They are arranged, with one exception, in the order of increasing power requirements at 90 deg. F. condenser air temperature and for air-resistance pressures of zero and 0.35 in. of water, respectively. The Carrier-Safety system was given a higher rank than the Trane because of the influence of factors other than power consumption.

At 90 deg. F. condenser air temperature, all but two of the mechanical compression systems tested delivered their rated capacity. The Frigidaire failed to produce its rated tonnage by 0.39 ton, and the Waukesha, in the three installations tested, failed by amounts up to 2.28 tons.

The steam ejector, ice activated, and evaporative cooling systems were not included in Table III, because their power requirements are of a different character and order. On the basis of power consumption, these systems cannot be compared directly with the mechanical compression systems. The only way in which such a comparison may be made is on a cost basis, as provided later in this report.

Steam-Ejector System.—The steam system requires both electrical power and steam; therefore, the power consumed is expressed in kw. and in lb. of steam per hr. The range for the one steam system tested was: 0.58 to 0.64 kw. per ton, and 30.5 to 34.6 lb. of steam



Comparative Total Costs per 1,000 Car-Miles of Four Different Methods of Air Conditioning Cars for a Cooling Season of Eight Months at an Average Speed of 50 M.P.H.

and its rated capacity at the refrigeration unit was obtained. The system tested consisted of: Carrier steam ejector; Safety pumps and motors; Carrier condenser; Aerofin cooling coils (Carrier-Safety design); weight, 3,698 lb.

Ice-Activated System.—The ice activated system tested consumed 0.17 to 0.21 kw. of electric power per ton of refrigeration and 76.7 to 78.3 lb. of ice per hr. per ton of refrigeration. At a cold-water temperature of 41 deg F., the system delivered its rated capacity. The system tested consisted of: American Car & Foundry bunker and cooling coils; Worthington pump; Master motor; weight, 3,845 lb. with bunker empty.

Evaporative Cooling System.—The Fleischer evaporative cooling system produces no refrigeration. The system has limited possibilities with respect to cooling railroad passenger cars. This system will produce comfort conditions only in those sections of the country where low wet-bulb temperatures prevail, or where only a slight temperature reduction is required. When used as a supplement to a refrigerating system, it operates only as an air washer. The Fleischer consumes 1.22 kw. of electric power. The system tested consisted of: Air and Refrigeration Corporation evaporative cooler; Worthington pump; Master motor; Clarage circulating fan; weight 612 lb.

Six Types of Drive Mechanisms Tested

The mechanical efficiency of six types of drive mechanisms, through which power is transmitted from the car axle to the cooling equipment, was determined, these drives being tested under the following conditions: The load ranged from zero to 36 hp. for the 20-kw. drives, from zero to 18 hp. for the 10-kw. drives, and from zero to 10 hp. for the 5-kw. drive. The Pullman direct drive was tested at constant torques of 51 and 71 ft.-lb., with

Table II—Scope of the A.A.R. Air-Conditioning Investigation

Number of air-conditioning systems tested in laboratory...	12	15
Mechanical compression	1	
Steam ejector	1	
Ice activated	1	
Evaporative cooling	1	
Number of drive mechanisms tested in laboratory...	6	
Belt	1	
Gear	2	
Belt and gear	2	
Friction	1	
Number of air-conditioned cars tested in hot room...	14	
Mechanical compression	7	
Steam ejector	1	
Ice activated	6	
Number of railroads that conducted road tests...	31	
Number of passenger cars on which road tests were conducted	594	
Railroad-owned air-conditioned cars	434	
Railroad-owned non-air-conditioned cars	40	
Pullman air-conditioned sleepers	120	
Percentage of railroad-owned air-conditioned cars tested to total number of railroad-owned air-conditioned cars as of March 1, 1936	18	
Approximate number of hours of road testing	5,200	
Approximate number of miles of road testing	240,000	
Number of passengers who submitted comments on conditions in air-conditioned cars while tests were being made	5,453	
Approximate number of data readings recorded for all laboratory and road tests	250,000	
Approximate number of calculations made from recorded data	85,000	
The analysis of costs is based upon an experience record of 1,608 cars for 1935 with a total car mileage of....	178,259,768	

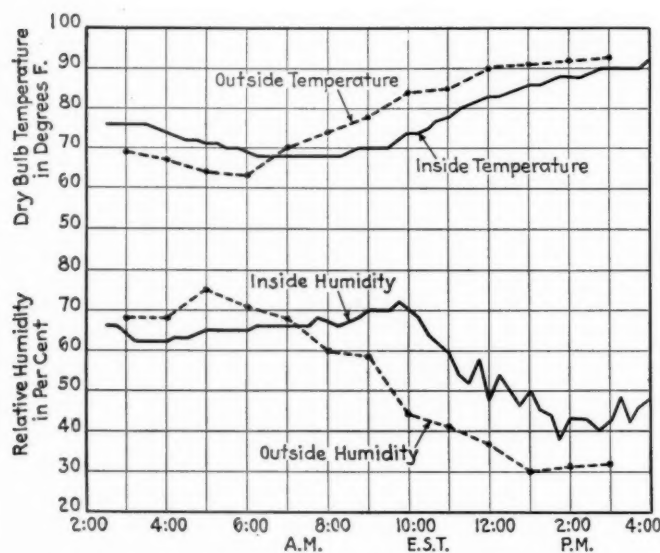
per hr. per ton of refrigeration, exclusive of the amount of condensate which ordinarily occurs in a train line. The electrical power required was approximately one-third of that required by the most efficient mechanical system. Throughout the entire range of condenser air temperatures at the zero resistance pressure, the capacity of the steam ejector system tested remained constant

speed-control setting of 42 m.p.h. The 71 ft.-lb. torque is that required to operate an air-conditioning system at full capacity. All drives were tested at speeds from 15 to 90 m.p.h. equivalent car speeds.

The test procedure developed the mechanical efficiency of the drive as a whole and that of each element of the drive. In Table IV and one of the charts are shown the mechanical efficiencies of the drives at different car speeds and the combined efficiencies of drives, generators and compressor motors.

The Pullman drive is a mechanical gear and belt drive with an electrically-operated speed control interposed between the drive and the compressor. The electro-mechanical drives each consist of a drive mechanism with a generator and electric motor interposed between the drive and the compressor.

The foregoing being the case, in comparing the Pullman drive with any other drive, the over-all efficiency of the latter should be used. For example, at 30 m.p.h.



Inside and Outside Temperatures and Relative Humidities During a 14-Hr. Run of a Non-Air-Conditioned Car

and full load, the mechanical efficiency of the Pullman drive is 77.0 per cent and that of the Spicer drive is 61.5 per cent.

In view of the trend toward higher train speeds, the comparison of the efficiency of the Pullman drive with the efficiencies of the other drives is significant. The Pullman drive is normally adjusted so that slippage in the speed control starts at a train speed of about 42 m.p.h. Below that train speed, the compressor is operated at reduced speed and, consequently, at reduced capacity. Adjustment of the speed control, together with changes in the gear ratio, will make it possible to increase the speed at which slippage starts. In some cases the speed-control setting has been advanced from 42 to 55 m.p.h. for high-speed trains in order to improve the efficiency in the upper range of speeds. This means some sacrifice in the cooling capacity at speeds below 55 m.p.h. Some railroads use a heavy oil and a high level of oil with the Pullman drive. A lighter oil and a lower oil level would increase somewhat the mechanical efficiency shown.

The Gerlinger drive may be disregarded for air-conditioning purposes, where mechanical compression systems are used, because of insufficient capacity.

While no quantitative data were taken regarding noise and vibration, it can be stated that there was very little

difference in the amount of noise and vibration noticed in the different drives, except in the case of the Foote Bros. gear drive which was quite noisy. It was found that if the gear centers on this drive were separated sufficiently to allow the proper amount of backlash, the noise was decreased materially and the efficiency increased about two per cent.

In addition to determining the mechanical efficiency of the drives, road performance data were obtained from 31 railroads concerning the installation, operation, repair and lubrication of drives. Unfortunately, sufficient information upon which to base a definite conclusion is not available concerning these important factors. This is, likewise, true of the relative cost and operating performance. These are matters which should receive additional study.

The cost due to the loss of belts may be an appreciable amount. This cost on one railroad, with 59 cars and over a period of 32 months, was approximately \$6,000. Belt losses and breakages are due to many causes, among which are flying ballast and the accumulation of snow and ice on the pulleys. One railroad increased belt life from 29,000 to 44,000 miles by increasing the diameter of the armature pulley from 8 to 10 in., using a 5-in. 6-ply rubber belt.

A gear-drive mileage of 350,000 has been reported with evidence of only ordinary wear.

The outstanding record reported was for a combination belt and gear drive which has been in service five years without failure. The mileage to September 1, 1936, is 1,000,000.

All types of drive, except the Spicer, generally may be installed with only minor changes in the running gear of the car to which applied. Care should be used in constructing and mounting all types of drives to avoid eccentricity. Some difficulty was experienced with all the drives tested because of bad workmanship and because they did not conform to the specifications. If this is a common experience, the manufacturers could save the railroads annoyance, delay and expense by giving more attention to such matters.

The primary difficulty in making repairs is the removal of bearings and frozen or rusted bolts. This difficulty is the result of faulty design.

The problems associated with lubrication point to needed improvements in the method of applying the lubricant by placing pressure fittings on grease cups and by extending the fittings so they may be reached easily with a grease gun; speeding up the lubricating process by reducing the types of tools required.

The reduction of weight is of such importance that the performance of lighter types should be observed closely.

Desirable Characteristics in Air Delivery

Among the objectives sought in air conditioning a car is the avoidance of hot and cold pockets and drafts. This means uniform temperature and air movement throughout the car. To effect such results, various means of delivering the air to the car are used. To determine the relative effectiveness of air-delivery methods, 14 cars, as received from the railroads, were tested in hot rooms.

These cars were equipped as follows: Four with an inside center duct; four with double outside duct; four with a single outside duct; and two with bulkhead delivery.

The test procedure involved taking temperature and air-velocity readings at 24 different stations in each car. There were 8 longitudinal points on each of 3 vertical levels. There was maintained in each car during the

test a dry-bulb temperature of approximately 80 deg. F. and a relative humidity of 50 per cent at the recirculated air grille.

The effectiveness of each air-delivery system was measured in terms of uniformity of temperature throughout the car, velocity and uniformity of the air movement, appearance or non-appearance of hot or cold spots,

method used in determining each of these elements of cost.—Editor]

Maintenance costs are shown separately in Table V. Table VI is presented for the purpose of showing how the total cost of installation, the cost of maintenance, and that of operation were resolved into the cost per 1,000 car-miles for each of four systems* under a given

Table III—Power Requirements of 12 Mechanical Compression Air Conditioning Systems Determined by Laboratory Tests

SYSTEM	DESCRIPTION					Kilowatts per ton of refrigeration at air resistance pressures in inches of water of		Wt. in lb.
	Compressor	Condenser	Evaporator	Compressor Motor	Expansion valve	Zero	0.35	
1. Airtemp-York (5-ton)....	York	York	York	Westinghouse	Detroit Lubricator	1.35	1.43	2795
2. Carrier-Safety.....	Safety	Aerofin(a)	Aerofin(a)	Safety	Detroit Lubricator	1.48	1.57	3030
3. Trane.....	Lipman	Trane evaporative	Trane	Wagner	Alco Constant Pressure	1.44	1.49	3660
4. Airtemp-York (6-ton)...	York	York-evaporative (b)	York	Westinghouse	Detroit Lubricator	1.59	1.65	2795
5. Airtemp-York (7-ton)...	York	York evaporative	York	Westinghouse	Detroit Lubricator	1.62	1.66	2795
6. B&O-York.....	York	York evaporative	York	Fairbanks-Morse	Detroit Lubricator	1.70	1.75	2396
7. General Electric.....	General Electric	Trane (c)	Trane (c)	General Electric	Detroit Lubricator	1.83	1.90	3081
8. Frigidaire.....	Frigidaire	Frigidaire	Frigidaire	General Electric	Frigidaire	1.96	2.03	2375
9. Waukesha-Sturtevant supercondenser.....	Ingersoll-Rand	Trane with Super-condenser	Sturtevant	Waukesha internal-combustion engine	Alco Thermostatic			4050
10. Baldwin-Southwark.....	De La Vergne			Century		2.48	2.78	3134
11. Waukesha-Sturtevant...	Ingersoll-Rand	Trane	Sturtevant	Waukesha internal-combustion engine	Alco Thermostatic			(Two units) 3450
12. Waukesha-Trane.....	Ingersoll-Rand	Trane	Trane	Waukesha internal-combustion engine	Detroit Lubricator			3420

(a) Carrier-Safety design.

(b) Above 100 deg. Fahrenheit.

(c) General Electric design.

presence or absence of drafts, and characteristics of the air flow.

In terms of the foregoing factors, the several types of air delivery fall in the following order of preference: Inside center duct, with approximately 20 outlets; double outside ducts, with the outlets in each duct not directly opposite those of the other duct; single outside duct (this type is much less desirable than either of the

set of operating conditions. The operating conditions stated in the title of this table may be taken as representing a general experience throughout the country. However, because of the marked influences that the length of the cooling season, the average speed in miles per hour and the total number of miles operated per year have upon the cost per 1,000 car-miles, four tables† have been prepared for cooling seasons of 3, 5, 8 and 10

Table IV—Mechanical Efficiencies of Car-Axle Drives for Railroad Air Conditioning Systems, at Different Car Speeds, and Combined Efficiencies of Drives, Generators and Compressor Motors

	Mechanical efficiencies in per cent at full load (b) and at car speeds of:				Friction horsepower at zero load
	30 m.p.h.	50 m.p.h.	70 m.p.h.	90 m.p.h.	
Pullman drive, including speed control with 42 m.p.h. setting (a).....	77.0	69.5	47.0	34.0	2.4
Spicer gear drive at 20 kw.					
Drive only.....	98.3	95.0	92.5	90.9	1.3 (c)
Drive, generator, and compressor motor.....	61.5	60.5	59.0	56.0	
Safety belt and gear drive at 20 kw.					
Drive only.....	93.5	92.5	91.0	89.5	1.55 (c)
Drive, generator, and compressor motor.....	58.5	59.0	57.5	55.0	
Foot Bros. gear drive at 10 kw.					
Drive only.....	92.5	91.3	89.5	88.5	0.8 (c)
Drive, generator, and compressor motor.....	58.0	57.5	56.0	53.5	
Jennings belt drive at 10 kw.					
Drive only.....	90.2	93.0	89.5	87.0	0.8 (c)
Drive, generator, and compressor motor.....	56.5	59.0	56.0	53.0	
Gerlinger friction drive at 5 kw.					
Drive only.....	92.5	87.5	84.5	81.5	
Drive, generator, and compressor motor.....	57.0	54.5	52.0	49.0	

(a) The Pullman drive transmits power directly to the compressor. at full load and include efficiencies of the speed control.

(b) Full load means maximum rating of drive.

(c) Generator friction not included.

The efficiencies are for 71 foot-pounds torque transmitted to the compressor

two foregoing); double and bulkhead; and center bulkhead.

The two types of bulkhead delivery of air are inferior to either inside center or double outside ducts. Bulkhead delivery should not be used except to meet unusual circumstances.

The total cost of air conditioning consists of four elements, namely: Cost of installation; cost of terminal facilities; cost of maintenance, and cost of operation. [The report here included a detailed description of the

months; for four train speeds of 30, 50, 70 and 90 m.p.h.; and for car mileages ranging from 50,000 to 250,000 miles per year.

The influence of these three variables may be seen from an examination of Tables VII and VIII.

Influence of Car Mileage.—For each system, the cost

* The Waukesha system was not included in the foregoing economic analysis because only one installation was made prior to 1936. An effort will be made to obtain the necessary information concerning the 1936 installations upon which to base an analysis.

† Owing to space limitations, tables for the 5 and 8-month periods only are included in this abstract.

per 1,000 car-miles decreases markedly with an increase in the number of car-miles per year. The reason for this is that the fixed charge is the predominating influence, with all the systems except ice, and hence its

Table V—Maintenance Cost of Air Conditioning—16 Railroads in 1935

	Number of units	Number of car-miles	Maintenance cost	
			Amount	Cost per 1,000 car-miles
Electro-mechanical	391	35,557,629	\$118,538.22	\$3.33
Direct-mechanical (Pullman) ..	312	42,926,532	100,043.03	2.33
Steam ejector	223	28,434,558	61,026.23	2.15
Ice activated	527	48,771,407	47,139.34	.97

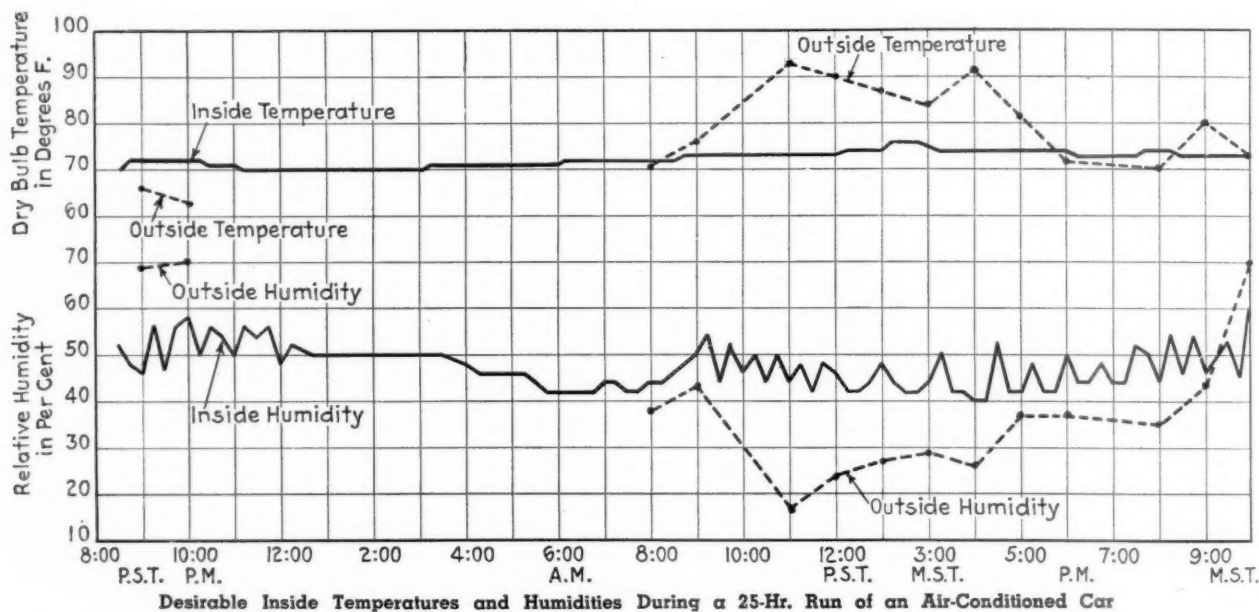
distribution over a large mileage reduces the cost per 1,000 car-miles.

Influence of Train Speed.—Increasing the speed from 30 to 90 m.p.h. changes the cost per 1,000 car-miles much less than does a change in the total car-miles. Therefore, in this connection, the speed in miles per hour is of much less importance than the total mileage per year. However, speed is a real factor. For instance,

circumstances to be confronted. The tables have been prepared so that the total cost per 1,000 car-miles may be determined in accordance with the character of the variables confronted.

The influence of the cost of installation and, therefore, of fixed charges upon the total cost of operation is of vital importance. The fixed charges for an ice system are the lowest of all systems. During cooling seasons of three and five months, the fixed charges of the ice system influence the total cost more than does the cost of operation, hence the total cost for the ice system is the lowest. However, with a cooling season of eight or ten months, the cost of operation of the ice system influences the total cost more than do fixed charges. This being the case, the ice system becomes more expensive than the electro-mechanical. The fixed charges for the electro-mechanical system are less than all other systems, except ice. For this reason, the total cost of operation of the electro-mechanical system for cooling seasons of eight and ten months is the lowest of all the systems.

It is recognized that in selecting an air-conditioning system there are other factors than cost which must be considered. These are reliability, adequacy of results



with the electro-mechanical system operating 150,000 miles per year, a change in speed from 30 to 50 m.p.h. reduced the cost per 1,000 car miles \$0.33. Similar results obtain with the other systems.

Influence of Length of Cooling Season.—As is to be expected, an increase in the length of the cooling season, everything else being equal, increases the cost per 1,000 car-miles. In the case of the direct-mechanical system with a mileage of 150,000 miles per year and a speed of 50 m.p.h., the cost per 1,000 car-miles is \$14.61 for a 5-month season and \$14.78 for an 8-month season. The total increase from a 3-month to a 10-month season is \$0.42 per 1,000 car miles.

Economics of Air Conditioning

From the foregoing, it is evident that the economics of air conditioning, from an operating standpoint, is affected by the three variables mentioned and, because of this, a categorical statement cannot be made as to which system is the best. In each case, the selection has to be made on the basis of the prevailing operating

obtained, terminal facilities, and other matters. However, gross installation costs and total operating costs per 1,000 car-miles are dependable units of measurement and, hence, due weight should be accorded them. This is especially true in the light of the large potential investment confronting the railroads through an increase in the number of cars to be air conditioned.

The over-all cost, efficiency and economy of any air conditioning system may be markedly affected by the cost, efficiency and economy factors associated with each element of the system. This means that in selecting and purchasing an air-conditioning system the purchase price, efficiency and economy of each part should be considered carefully. Otherwise, there may be no assurance of the merits and the reasonableness of the cost of the system selected.

Factors Relating to Passenger Comfort

Variations in conditions in 302 air-conditioned cars were determined from data gathered by 20 railroads during regular service runs made from August 1 to Septem-

ber 15, 1936. [The report here included desired and actual results secured in road tests of the air-conditioned cars as regards inside temperatures, relative humidity, temperature distribution, air movement and variations in volume of fresh air.—Editor]

Records of conditions inside and outside of cars were

Table VI—Total Cost Per 1,000 Car-Miles for Four Types of Air-Conditioning Systems for Railroad Passenger Cars for an Average Cooling Season of Five Months, an Average Train Speed of 50 M.P.H., and an Average Car Mileage of 150,000 Miles Per Year, Based on Experience of 16 Railroads in 1935

	Electro-mechanical	Direct-mechanical	Steam ejector	Ice activated
GROSS INSTALLATION COST				
(a) Charged to investment account (gross).....	\$6,110.00	\$8,493.00	\$8,242.00	\$3,587.00
(b) Charged to operating expense account	374.00	22.00	233.00	395.00
Total	\$6,484.00	\$8,515.00	\$8,475.00	\$3,982.00
ANNUAL FIXED CHARGES				
(a) Investment:				
Depreciation at 12.5 per cent.	\$763.75	\$1,061.63	\$1,030.25	\$448.38
Interest at 6 per cent.	366.60	509.58	494.52	215.22
Taxes and Ins. at 1.5 per cent.	91.65	127.39	123.63	53.80
Total	\$1,222.00	\$1,698.60	\$1,648.40	\$717.40
(b) Operating expense:				
Allocated over life of equipment at 12½ per cent.	46.75	2.75	29.13	49.38
Total annual fixed charge	\$1,268.75	\$1,701.35	\$1,677.53	\$766.78
TOTAL COST PER 1,000 CAR-MILES				
(a) Fixed charges.....	\$8.45	\$11.35	\$11.18	\$5.11
(b) Operation cost.....	.99	.93	1.02	5.29
(c) Maintenance cost.....	3.33	2.33	2.15	.97
Total	\$12.77	\$14.61	\$14.35	\$11.37

obtained for each of the runs made. In the reports to the 31 individual railroads, whose cars were tested, these records in graphical form will be shown.

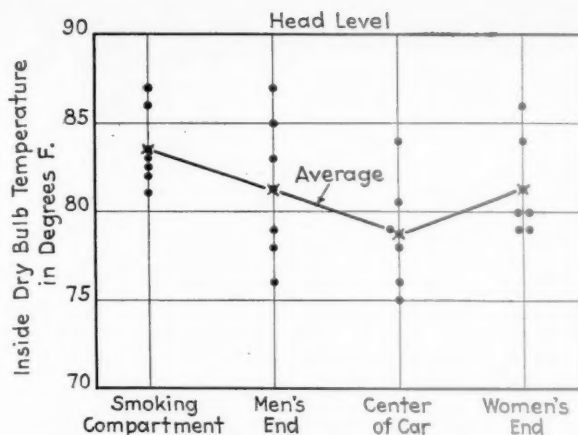
As examples of the character of the information obtained, a few graphs illustrating typical conditions are illustrated. One shows a 14-hr. run of a non-air-conditioned car; another, a 25-hr. run of an air-conditioned car during which desirable conditions prevailed; a third,

Table VII—Comparative Total Costs Per 1,000 Car-Miles of Four Different Methods of Air Conditioning Railroad Passenger Cars for a Cooling Season of Five Months

	Cost per 1000 car-miles on the basis of the following car-miles per year				
	50,000	100,000	150,000	200,000	250,000
Train speed of 30 m.p.h.:					
Electro-mechanical	\$30.13	\$17.44	\$13.20	\$11.09	\$9.82
Direct-mechanical	37.65	20.64	14.98	12.13	10.43
Steam ejector	37.13	20.36	14.76	11.97	10.28
Ice activated	24.91	17.25	14.69	13.42	12.65
Train speed of 50 m.p.h.:					
Electro-mechanical	\$29.70	\$17.01	\$12.77	\$10.66	\$9.39
Direct-mechanical	37.28	20.27	14.61	11.76	10.06
Steam ejector	36.72	19.95	14.35	11.56	9.87
Ice activated	21.59	13.93	11.37	10.10	9.33
Train speed of 70 m.p.h.:					
Electro-mechanical	\$29.61	\$16.92	\$12.68	\$10.57	\$9.30
Direct-mechanical	37.30	20.29	14.63	11.78	10.08
Steam ejector	36.65	19.88	14.28	11.49	9.80
Ice activated	20.24	12.58	10.02	8.75	7.98
Train speed of 90 m.p.h.:					
Electro-mechanical	\$29.72	\$17.03	\$12.79	\$10.68	\$9.41
Direct-mechanical	37.46	20.45	14.79	11.94	10.24
Steam ejector	36.79	20.02	14.42	11.63	9.94
Ice activated	19.62	11.96	9.40	8.13	7.36

an air-conditioned car test during which both high inside temperature and wide variation in temperature distribution prevailed; and a fourth, a run of an air-conditioned car during which both a desirable inside temperature throughout the run, and a uniform temperature distribution throughout the length of the car prevailed.

In these charts, each dot represents a reading of tem-

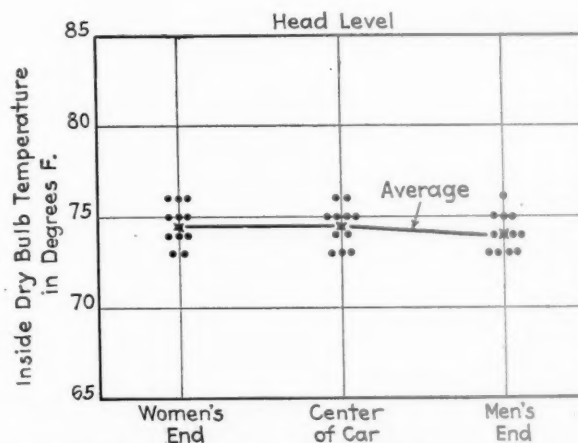


An Air-Conditioned Car with Both High Inside Temperature and Wide Variations in Temperature Distribution

perature in deg. F. at the positions in the car indicated. The line designated "average" connects the averages of the readings at the several positions.

Temperature and Humidity Control.—The process of cooling cars, like that of heating, requires some form of temperature control. The optimum comfort in air-conditioned cars will not be attained until the control problem is solved. The solution of the problem will also contribute to a reduction in operating costs. There are three general types of controls: manual, semi-automatic and automatic. The latter two, accomplished by various means, will be discussed at length in the engineering report. The manual type of control is highly unsatisfactory. If uniform and regular performance is desired, it should not be used. The semi-automatic type is a marked improvement over the full manual, but the human element is associated with it. The elimination of this element is desirable. The automatic types have not been perfected to the degree desired. There is much development work necessary. There are those who feel that a form of modulated temperature control is needed. Such a type of control would automatically maintain within the car a predetermined number of degrees lower temperature than the outside temperature. A successful control of this type would mark a real advance in air conditioning. Temperature control is inseparably associated with humidity control. There is a diversity of opinion as to the need for humidity control. Most authorities agree that some type of humidity control is advisable.

Filters.—An important advantage of air conditioning passenger cars is cleanliness. This is, perhaps, as much



An Air-Conditioned Car with Both Desirable Inside Temperature and Uniform Temperature Distribution

appreciated by the traveling public as the lowered temperature. The cleaning is done by passing air through filters. These are, therefore, an essential element in an air-conditioning system. They are not only important from the viewpoint of cleanliness, but also with respect to odors. The filter problem is indicated by the many different types being used. They are either dry or impregnated with oil of varying viscosity, and are made

quently cleaned or renewed. From the use of oil on the filters, a gummy substance settles in the ducts which absorbs odors from cosmetics, tobacco, garbage and other material. Deodorants have been used with varying success. The use of ozone has been widely discussed as a purifying agent. Its value is doubtful.

Passenger Reactions and Comments

One phase of the road work was to ascertain the reactions of passengers to the conditions prevailing in the air-conditioned cars. At the time the road engineers were making observations in a car, each passenger was given a card. This card requested the passenger to co-operate in making the study by indicating thereon his reaction to a number of factors, such as temperature, odors and the like. Through this means it was possible definitely to associate passenger reactions with the actual conditions prevailing in the car at the time the cards were filled out.

Cards were returned to the road engineers by 5,453 passengers traveling in cars owned by 20 railroads. These cards were obtained throughout the United States and from Montreal to the Pacific Coast in Canada.

The number of items on the card made it possible for the 5,453 passengers to make 64,814 separate and distinct comments. Of this number of possible comments, only 2,822, or 4.4 per cent, were in any sense unfavorable to the conditions these passengers were experiencing. An analysis of these comments appears in Table IX.

Complimentary statements, most frequently repeated, were: Comfortable, 301 times; very good, 164 times; perfect, 162 times; improvement, 144 times; train now preferred to other means of travel, 41 times; a pleasure to travel in such a car, 37 times; cleanliness appreciated, 33 times.

Some representative statements written by passengers were: "When one gets off at destination, one is just as fresh and clean as at the beginning of the trip"; "The greatest development for the comfort of passengers"; "A real treat on a hot day like this"; "Beats driving a car"; "Air system has sold me on railroad travel in summer months"; "Luxurious beyond dreams of a lady of horse-and-buggy days"; "Whoever is responsible for air conditioning should have a monument erected"; "Would like to travel forever under these conditions."

Table VIII—Comparative Total Costs Per 1,000 Car-Miles of Four Different Methods of Air Conditioning Railroad Passenger Cars for a Cooling Season of Eight Months

	Cost per 1000 car-miles on the basis of the following car-miles per year				
	50,000	100,000	150,000	200,000	250,000
Train speed of 30 m.p.h.:					
Electro-mechanical	\$30.49	\$17.80	\$13.56	\$11.45	\$10.18
Direct-mechanical	37.91	20.90	15.24	12.39	10.69
Steam ejector	37.39	20.62	15.02	12.23	10.54
Ice activated	29.63	21.97	19.41	18.14	17.37
Train speed of 50 m.p.h.:					
Electro-mechanical	\$29.92	\$17.23	\$12.99	\$10.88	\$9.61
Direct-mechanical	37.45	20.44	14.78	11.93	10.23
Steam ejector	36.88	20.11	14.51	11.72	10.03
Ice activated	24.44	16.78	14.22	12.95	12.18
Train speed of 70 m.p.h.:					
Electro-mechanical	\$29.77	\$17.08	\$12.84	\$10.73	\$9.46
Direct-mechanical	37.51	20.50	14.84	11.99	10.29
Steam ejector	36.77	20.00	14.40	11.61	9.92
Ice activated	22.27	14.61	12.05	10.78	10.01
Train speed of 90 m.p.h.:					
Electro-mechanical	\$29.85	\$17.16	\$12.92	\$10.81	\$9.54
Direct-mechanical	37.68	20.67	15.01	12.16	10.46
Steam ejector	36.88	20.11	14.51	11.72	10.03
Ice activated	21.21	13.55	10.99	9.72	8.95

of spun bronze wool, not coated; series of wire screens of progressive decrease in mesh, oil coated; metal shavings packed in a frame; spun glass; copper sprayed with oil; impregnated hair; oiled paper; perforated cardboard coated with oil; and others. They range in price from 65 cents to \$17 each. The filter is too important an element with respect to cleanliness, odors and operation costs to be neglected. There is a real need for a thorough and exhaustive study of the entire filter situation.

Odors.—The problem of odors is universal. Some railroads have had reasonable success in reducing them. Odors result mainly from gas or smoke from the locomotive, tobacco smoke, body odors given off by passengers, improperly maintained toilets, refuse thrown on the

Table IX—Analysis of the 4.4 Per Cent of Passenger Comments Which Were Unfavorable

	Number of comments	Percentage of total comments
Much too warm	75	2.7
Slightly too warm	505	17.9
Much too cool	51	1.8
Slightly too cool	530	18.7
Clammy	113	4.0
Stuffy	240	8.5
Drafty	197	7.0
Noisy	196	6.9
Too cool upon entering	205	7.3
Objectionable odor	140	5.0
Excessive tobacco smoke	135	4.8
Too much heat from sunshine through windows	435	15.4
Total number of unfavorable comments..	2,822	100.0

floor by passengers, and from cooking and garbage in the dining cars. Odors are aggravated by humidity in excess of 60 per cent within the car and by an excessive use of disinfectant. Tobacco smoke, dust and moisture produce a sour smell in the cooling coils if they are not cleaned often enough. Filters become impregnated with nicotine and grease, and odors result if they are not fre-

F. D. R. Would Revamp Regulatory Commissions

(Continued from page 145)

should in the first instance decide the cases and issue orders, and the judicial section should sit as an appellate body to which such decisions could be appealed on questions of law.

"The present commissioners as a body would assume the status of a judicial section. The present staff of the commission under a responsible administrative chief could, with a minimum of disruption, be molded into an administrative section. It is difficult to see how the transition could be very disturbing or why the plan should not work smoothly and efficiently.

"Furthermore, the principle of the plan does not have to be applied with exact uniformity to every commission. The requirements and present practices of each commission may be taken into consideration in carrying out this principle."

Railroads Ask Rate Decisions by Commodity Groups

Additional revenues required for new equipment and maintenance—May need 2,400 locomotives, 180,000 freight cars

WASHINGTON, D. C.

HEARINGS before Commissioner Aitchison of the Interstate Commerce Commission in Ex Parte No. 115, on the proposals of the railroads for a freight rate readjustment to provide part of the revenue lost with the expiration of the emergency charges on December 31 were continued this week after the commission had taken under consideration a ruling on a suggestion made by the railroads for a change of procedure by which the commission would render decisions from time to time by groups of commodities instead of treating the proceeding as a single case.

This suggestion was offered in a statement by R. V. Fletcher, general counsel of the Association of American Railroads, on the fourth day of the hearing which began on January 6, and after the railroads had presented their preliminary general testimony. It was vigorously opposed by committees representing the shippers and state commissioners.

Mr. Fletcher said that the carriers, desirous of having a decision by the commission at a date as early as possible with respect to the more important commodity groups, suggested that at the present hearing, which presumably would terminate on January 16, the carriers complete their testimony as to coal and coke; iron ore; iron and steel; lime, plaster, cement, etc.; and, if time permitted, petroleum products, and that when these groups were completed, the commission direct that the protestants offer their testimony with reference to the commodities mentioned, so that the records might be closed as to them, and that they be submitted to the commission for final decision in the regular way.

It was also suggested that when hearings are resumed, after the inauguration ceremonies in Washington next week, the carriers proceed to present their testimony as to other commodity groups and that the records as to those groups be submitted for decision under a like procedure. In submitting this proposal, he said, the carriers would offer no objection to referring certain parts of the case to examiners, so that two or more hearings might be in progress simultaneously, either at Washington or elsewhere.

Shippers Oppose Plan

After the representatives of shippers and state commissioners attending the hearing had filed their statements opposing the plan Commissioner Aitchison announced on January 11 that, while a decision as to the entire suggestion would be deferred, arrangements would be made for completion of testimony by all concerned by groups and as well as for simultaneous hearings at different points in the country.

A committee of counsel representing shippers said they were unanimously opposed to the suggestion, that Ex Parte No. 115 has been from the first a general

revenue case and that the primary question has been and still is whether the railroads are entitled to additional revenue from increased rates. If additional revenue is required, they said, the second question is what commodity should contribute to this need and the third question is as to the proportion in which they should respectively contribute. A fourth question is whether, with respect to any commodity group, increases in rates will in fact produce added revenue.

"It is important to adhere to sound procedure," the Committee added. "Either this is a general Ex Parte investigation or it is not. If it is a general investigation, the record should not be closed as many times as there are different commodity groups. If it is not a general investigation, but is a proposal to make separate and unrelated increases in rates on different groups of commodities, then the statute indicates the procedure to be followed through the filing and suspension of tariffs. These two kinds of procedure should not be confused or commingled as they would be if this is looked upon as a single general investigation in which the record is to be closed serially from time to time.

"The shippers may be counted upon to cooperate in any plan that gives them reasonable opportunity to be heard and which gives them the benefit of the entire record in this investigation. To deny them this by adopting the radical and belated suggestion of the carriers, made after the completion of their general case and after many of the parties have left for home would not only be unfair but it would be at variance with sound procedure."

Additional Revenues Needed Badly

J. M. Symes, vice-president in charge of the operations and maintenance department of the Association of American Railroads, testified on January 7 that additional revenues are urgently needed by the railroads, not only for the purchase of new equipment, but also for maintenance purposes in order to enable them to maintain adequate transportation facilities.

"The railroads," Mr. Symes said, "had little difficulty in meeting freight car requirements from 1930 up to 1936, when increased demands for transportation facilities and a reduction in the number of serviceable freight cars made the matter of providing an adequate supply an active problem. Notwithstanding the installation of 39,556 new freight cars in the first eleven months of 1936 and a reduction of 49,633 cars in the number awaiting repair, both the ownership and the number of serviceable cars on December 1, last, were the lowest since prior to the World War. This situation in part was due to the curtailment of car maintenance programs by the railroads and deferred car purchases due to the financial condition of the railroads since the depression began. It also was due to some extent to the fact that the railroads

found that it was cheaper to retire certain obsolete equipment than to attempt to repair it."

Mr. Symes said the railroads were fortunate when the depression began in having their equipment and roadbeds in good physical condition but that the time has now come when increased maintenance expenditures should be made.

The number of freight cars and locomotives installed in the first eleven months of 1936, Mr. Symes said, was greater than for any calendar year since 1930. In the case of freight cars, however, he said the number placed in service in 1936 was nearly 75,000 below the average number installed annually in the seven-year period from 1923 to 1929, while for locomotives the number installed in the first eleven months this year was nearly 2,000 under the seven-year average.

Additional Equipment Will Be Needed Soon

Due to improvements that have been made in construction of locomotives and freight cars, and increased efficiency in operation which has been developed by the railroads, the reduction in the number of locomotives and freight cars owned by the railroads has been to some extent counterbalanced. He added, however, that the reserve of serviceable freight cars and locomotives has just about reached the point where additional equipment must be placed in service.

Expenditures for maintenance purposes in 1936, according to incomplete reports, were approximately \$1,242,000,000, Mr. Symes said. While this exceeded such expenditures for each of the years since 1930, it was only approximately one-half as much as the annual average for the seven years from 1923 to 1929, inclusive.

On cross-examination Mr. Symes said that a 5 per cent increase in traffic in 1937 would require 60,000 additional cars and 800 locomotives and that a 15 per cent increase would require 180,000 more cars and 2,400 more locomotives. He said there had been no great shortage of coal cars and that the railroads would be able to protect coal loading requirements during the winter.

D. T. Lawrence, chairman of the Trunk Line Association and of the Traffic Executives' Association for eastern territory, described the events leading up to the present proposal of the railroads and the studies made by committees of traffic officers. He said the rates are intended for permanent application except as to certain rates intended to meet truck and water competition which are regarded as experimental and are proposed with expiration dates. While most of the rates proposed represent increases there are some reductions, and some of the increases are greater or less than the emergency charges, while some are applied to traffic not effected by the emergency charges and in some cases no increases are proposed as to commodities that did bear the emergency charges.

In reply to questions he said that no general estimate had been made as to the revenues expected from the increases proposed and that the committees had had no instructions as to how much money to try to raise or as to any percentage. He said they were asked to get all they could properly and that all he could say as to the amount was that it would be less than that of the emergency charges and less than 4 per cent of the total freight revenues.

J. E. Tilford, chairman of the Southern Freight Association, explained the railroads' proposals as they affect southern territory and introduced a bulky exhibit showing the large number of reductions in rates that have been made in that territory since January 1, 1928, and

another showing reductions made within the past six months. He expressed the opinion that the moderate increases proposed would not interfere with the movement of the traffic affected. Other testimony regarding the rate proposals was given by L. G. Raemiller, of the statistical bureau of the western railroads; R. C. Fyfe, chairman of the Consolidated Classification Committee; Roy S. Kern, chairman of the Central Freight Association coal, coke and iron ore committee; J. A. Poveleite, assistant freight traffic manager of the New York, New Haven & Hartford; F. W. Nyland, coal traffic manager of the Delaware & Hudson, and R. E. Barr, assistant traffic manager of the Illinois Central.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended January 2 totaled 587,953 cars, an increase of 25,735 cars or 4.6 per cent above the preceding week, an increase of 46,127 cars or 8.5 per cent above the corresponding week in 1936, and an increase of 90,679 cars or 18.2 per cent above the corresponding week in 1935. All commodity classifications except forest products showed increases over the preceding week, and all commodity classifications except coal showed increases over last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For the Week Ended Saturday, January 2

Districts	1937	1936	1935
Eastern	133,038	125,461	116,456
Allegheny	127,083	107,504	95,837
Pocahontas	44,061	42,530	36,672
Southern	86,016	79,281	76,358
Northwestern	63,298	62,813	56,923
Central Western	85,518	79,101	72,758
Southwestern	48,939	45,136	42,270
Total Western Districts	197,755	187,050	171,951
Total All Roads	587,953	541,826	497,274
Commodities			
Grain and Grain Products	25,727	25,068	22,016
Live Stock	11,644	11,024	13,829
Coal	131,137	146,369	127,477
Coke	10,544	9,504	6,883
Forest Products	25,075	21,257	16,166
Ore	8,969	4,722	2,449
Merchandise L.C.L.	132,592	123,908	126,490
Miscellaneous	242,265	199,974	181,964
January 2	587,953	541,826	497,274
December 26 .....	.....	562,218	466,688
December 19 .....	.....	729,696	600,666
December 12 .....	.....	738,747	616,650
December 5 .....	.....	744,957	638,518

Car Loading in Canada

Total loadings in Canada for the week ended January 2 were 37,290 cars, as against 36,152 cars for the previous week and 34,458 cars for the week ended January 4, 1936.

The Dominion Bureau of Statistics has announced that the Canadian revenue car loadings for the week ended January 2, 1937, will not be included in the totals of either 1936 or 1937 and the week ended January 9 will be considered as the first week in this year. This procedure will make the week ended January 1, 1938, the last week of 1937.

Proper Locomotive Design Will Improve Riding Qualities

Improved guiding, vibration dampening and equalization and cushioning of flange pressures are important factors

By J. G. Blunt

Chief Mechanical Engineer, American Locomotive Company

WITH the advent of increased locomotive speeds we are more and more confronted with nature's law that stresses of the fundamental parts increase about as the square of the speed. Therefore, to obtain smooth riding and the lowest stress conditions, in the right-of-way as well as in the locomotive, it is of prime importance to improve the guiding qualities, dampen out vibrations, equalize and cushion the wheel-flange pressures against the rail and perfect the moving mechanisms so as to be free of any binding, twisting or out-of-alignment condition. The solution of these problems prevents the concentration of operating stresses and distributes them more equally over the entire structure, resulting in a smooth gliding movement at higher speeds than are otherwise safe or practicable.

The following suggestions are presented as a contribution toward the attainment of these objectives. They can evidently be employed more effectively in new designs, although existing locomotives could in many instances be greatly improved by applying at least some of the guiding principles herein outlined.

The single-ended through-frame construction with multiple-wheel assembly having a leading truck, drivers and trailing truck, if provided with cushioned lateral-

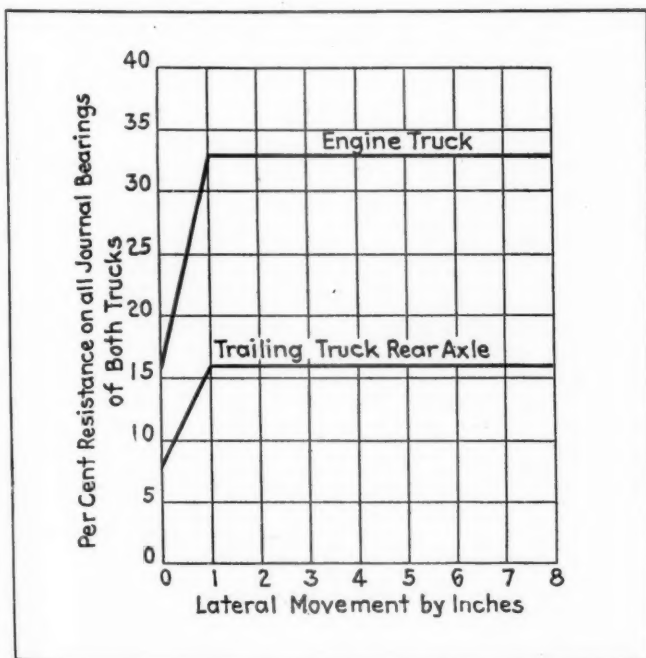


Fig. 1—Chart Showing the Lateral Resistance of Engine and Trailing Truck

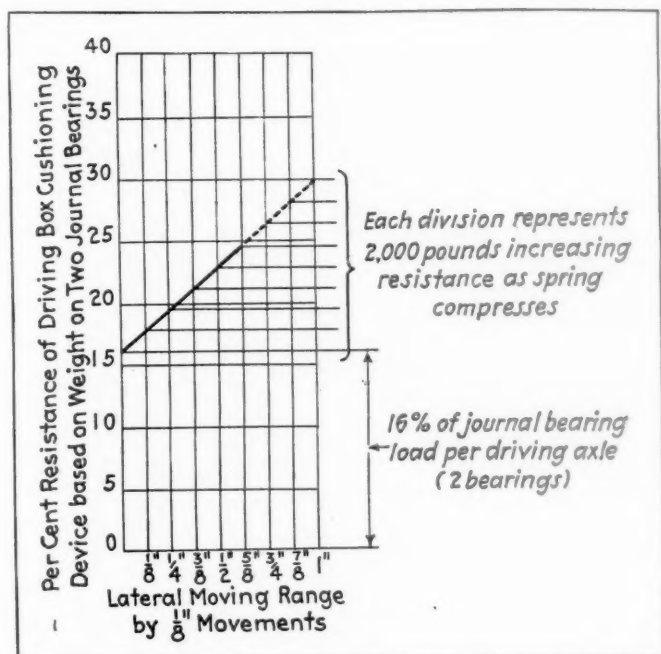


Fig. 2—Diagram Illustrating the Effect of Lateral-Motion Cushioning Devices on Driving Axles

motion resistance characteristics such that those at the leading end largely overcome those at the rear end, will most effectively absorb the centrifugal and other curving forces and guide the locomotive more smoothly through curves at higher speeds than any form of double-ended construction, unless its lateral-resistance mechanism can be made to accomplish an equivalent result. Further, it is important to provide means for each wheel flange of the locomotive to bear against the rail, equalizing its rail pressures with adjacent wheels on curves, in which case flange lubrication can be largely if not wholly eliminated.

With these things accomplished, concentrated hub friction, excessive wheel and axle-bending stresses, frame stresses, as well as high rail stresses will be greatly reduced.

The leading truck is the most effective guiding element of the locomotive and its lateral-moving-resistance mechanism should be such as to offer an increasing resistance through the first one inch or so of lateral movement, thereafter continuing constant throughout its full range of lateral movement. The trailing truck, being a less effective guiding element, should be provided with a lateral-moving mechanism having the same character-

istics but just sufficient initial resistance to prevent vibration on tangent track. Fig. 1 shows these conditions.

The building up of these resistances from a low initial to the constant provides the cushion when entering a curve and, in addition, provides the equivalent effect of passing a much longer radius curve, and eliminates the lateral jerking movements at the rear end which a high initial resistance would produce when first entering a curve. The same effect is obviated at the rear end when the trailer truck starts to move from the normal or central tangent-track position. The lateral-resistance mechanisms on leading and trailing trucks should be of a truly aligned roller type, with accurately finished rolling surfaces, which will provide the best resistance characteristics, the least wearing friction and a more perfect mechanical movement, with minimum resulting wear and maintenance expense.

Next to the trucks the front driving axle, when located in close proximity to the rear engine-truck wheel, is the most effective guiding wheel and should have a properly proportioned lateral-resistance cushioning device with sufficient lateral moving range to maintain it in spring suspension throughout its full range of lateral displacement. This axle so equipped equalizes its flange pressure with the engine-truck wheel flanges. Their sum subtracts from the flange pressure of the second pair of drivers, each contributing its equalized part in turning the locomotive on curves, at the same time preventing a wheel-bound condition between the driving box and the wheel flange of the front driving axle.

This wheel binding is one of the most fruitful causes of rough riding, derailment and rail spreading, producing, as it does, a hitch-hiking movement when passing curves. By this is meant that the front driving-wheel flange, when entering or passing a curve, is forced hard against the outer rail and can follow the curve only by instantaneously and rigidly turning the entire superstructure of the locomotive. If the speed is fast enough, the only alternative is for this wheel to jump the rail, spread the track or press hard enough against the rail to turn the entire superstructure. In the latter case there is a succession of pinching and releasing of this front driving-wheel flange while passing a curve, causing intermittent and increasingly high rail, wheel and axle stresses, together with excessive hub pressures. The cushioning device, therefore, smooths out these conditions and enables the front axle to pass freely around curves. Its initial resistance, together with the increasing resistance built up as its moving range increases, contributes additionally to the smooth guiding provided by the leading truck. If the second pair of drivers is an intermediate axle, it should also be equipped with a lateral-cushioning device with a less lateral moving range than the forward driving axle, thus equalizing an additional pair of wheel flanges when passing curves. In no case should a lateral-cushioning device be applied to the main axle because of the added misalignment on the main crank-pin bearings.

It follows that all tires should be set $53\frac{3}{8}$ in. apart, so as to effect the utmost in guiding by having each wheel flange bear against the rail on curves, with a minimum lateral sliding across the rail. No closer setting of tires should be permitted except in extreme cases where passing of maximum curves can not be accomplished otherwise. Unflanged plain tires should never be used, because the lateral pressure required to slide such wheels across the rail on curves imposes continuously excessive flange pressures on the adjacent wheels, especially those next ahead. Such wheels offer no guiding resistance, and, on the contrary, subtract from the lateral guiding forces at the leading end of the locomotive a substantial

amount necessary to slide their plain tires across the rail. Fig. 2 illustrates the effect of lateral-moving cushioning devices on driving axles.

From the experience thus far obtained by the application of the foregoing principles of locomotive construction, it seems fair to assume that with driving wheels correctly counterbalanced for revolving, reciprocating and cross-counterbalance conditions, we shall have accomplished the equivalent result of more smoothly passing a much longer radius curve and, where desirable, of permitting with safety a materially higher center of gravity.

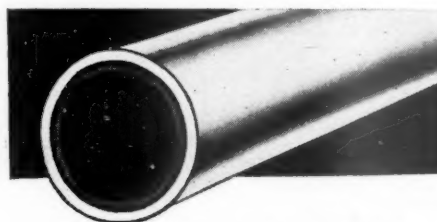
There are many other problems, such as the elimination of vertical vibration through the use of dampening mechanisms, roller bearings, especially on the main axle, to preserve the best possible alignment of main crank-pin bearings, reduced rod-bearing pressures safely to permit the use of high-tensile, reduced-weight rod material, with less danger of heating, improved rod-bearing design to obtain better lubrication and to overcome bushing growth with probably lower rod and driving-box application pressures than commonly used.

Some may say the Mallet articulated locomotive is unsuitable and unsafe for high speed. It would seem more to the point to improve the functioning of the mechanism rather than broadly to condemn the type. Properly designed and constructed, there seems to be no better type locomotive for fast-freight service up to 75 m.p.h. yet developed when more than four driving axles are required for obtaining the desired tractive force.

It seems only natural from both the safety and maintenance standpoint that these improved guiding characteristics, equalizing of flange pressures and dampening out of vibrations, combined with more perfect mechanical movements, should appeal strongly to maintenance-of-way officers as well as to those charged with locomotive upkeep.

New Type of Fence Wire

THE American Steel & Wire Company, Chicago, has introduced a new type of galvanized steel fencing wire that is the result of five years of research conducted by M. W. Reed, chief engineer and F. C. Elder, chief metallurgist, in co-operation with the technicians of the Tennessee Coal, Iron & Railroad Com-



A Sectional View of the New Wire

pany, Birmingham, Ala., and the Columbia Steel Company, San Francisco, Cal., also subsidiaries of the United States Steel Corporation.

The core of this wire is of full-content copper-bearing steel that is galvanized by a new process that produces an inner coating comprising a zinc-iron alloy fused to the steel, with an outer coating of commercially pure zinc. The process produces a lustrous surface on the zinc and the wire is said to possess improved rust resistance. The new wire is available in the form of plain wire, barbed wire and woven wire fencing.

Communications and Books . . .

Carriers' Rivalry Should Be Secondary to Public Interest

CHICAGO

TO THE EDITOR:

Self-interest, rather than the public's interest, has usually dictated the approach to the question of equalizing regulation of rail carriers' competition with motor carriers by the railroads, the automotive industry, and the traveling and shipping public who have benefited particularly by the evolution of the motor carrier. To the layman, characteristically feeling himself not directly involved, it appears merely to involve highway maintenance and highway regulation. He further feels that since the motor carriers are performing a public service their right to the highways should not be disputed and that they certainly should not be suppressed in the interest of the railways. This apathetic viewpoint of the layman is short-sighted, for the public ultimately shoulders the cost.

That the prohibitions, duties and penalties of the Act to Regulate Commerce were salutary is proved by the tremendous growth of the railroads subsequent to its passage—but the intrusion of the motor carrier into the transportation field has destroyed the monopoly of the railroads and has seriously endangered their progressive standards. The public should be brought to realize its own interest in maintaining an adequate, efficient railroad system and that under present conditions this can be done only by lessening the outmoded regulations applying solely to them, permitting them to compete, upon an equal basis, for their share of the transport business.

It is not the opinion of responsible railroad managers that restrictions found in Sections 2, 3, 4 and 6 of the Act should be made against the motor carrier; there is, in fact, no public demand for this type of regulation. The public's right to the use of any and all forms of transportation should not be abridged, providing they can justify themselves on grounds of efficiency and economy. But the public cannot choose to its own best interest between competing agencies of transport when one of them is highly restricted and the other is practically a free agent. It is not in the public interest that the inherent efficiency and economy of railroad service should be hedged in by artificial regulatory restrictions—applied to the railroads only—which restrictions are no longer needed in the public interest since monopoly in transportation is a thing of the past.

Let us hear less of "justice" to this or that agency of transportation or the "advantages" it offers, and seek honestly to find wherein the true public interest lies.

WILLARD COLE

Employees Interest in Retirement Act Revision

SAN FRANCISCO

TO THE EDITOR:

I was told by Brotherhood officials last year, about the Railroad Retirement Act, that "the plan is a tentative one, subject to very early revision" and "that we anticipate being able to eliminate some of its imperfections by amendment and eventually secure an adequate retirement plan." However, I was curious to know what my contributions would bring me, and as the result of my study, I listed some of my observations in an article which was printed in the August 29, 1936, issue of *Railway Age*.

The fact that there may not have been a general protest against the Retirement Act does not prove that it is reasonable, equitable or satisfactory. Many employees, due to apathy or sublime belief and confidence in Brotherhood officers, are not acquainted with the provisions of the Act, and when informed on the subject, are astounded that their representatives should have advocated its passage. The older ones, for obvious reasons, say it is good for them but admit it is unjust to the young employees. Young employees who understand the Act resent the unjust burden that has been placed upon them, but hopelessly accept it as

a necessary adjunct to the present day governmental philosophy.

Some of the misunderstanding may be due to the fact that some of the Brotherhood officers are not well posted. For example, a local San Francisco chairman told me in writing "If an employee dies before attaining the age of 65, his widow will receive the benefit of what he has paid into the fund with interest of 3 per cent per year added." There is no such provision in the Act.

Many young employees are relying upon the Courts for the correction of the injustice, and withdrawal of the case from the courts prior to a decision would leave the confiscated and excessive employee contributions permanently impounded in the U. S. Treasury. Such action would be a most unfortunate betrayal of the young employees and all conscientious railroaders should oppose any such suggestion.

After the courts have passed upon the Act, may I suggest that the committee charged with the task of drafting any new bill which may be proposed be governed by the advice of an experienced actuary; to employ a lawyer who can state the provisions in plain English; to be guided by plain, elemental justice; to remove the unjust burden from the young employee; to correct the many other inequities, and to consult with a representative number of employees, other than Brotherhood officers.

In the interest of efficiency and economy, any compulsory plan should be administered by each railroad company, and not by a governmental board for reasons which should be obvious to any one with experience in dealing with government boards and commissions.

There is no Act empowering the Brotherhood officers to speak for the employees in matters of pension legislation, and while I do not wish to comment here upon the apparent motive for their action in promoting such legislation, I do charge them with full responsibility for the deliberate placing of an unjust and unreasonable burden upon the young employees, and the stark and inexcusable failure to consummate anything of general benefit to their constituents as a whole. Social security and planned economy seem to be in vogue today, and if such legislation is on the "must" list, let us get as much justice into it as possible.

E. F. HULL

New Book

1936 Book of A.S.T.M. Standards. Two volumes, 6 in. by 9 in., totaling 2,400 pages. Published by the American Society for Testing Materials, 260 South Broad street, Philadelphia, Pa. Both volumes in cloth, \$14; in half leather, \$17. Can be purchased separately.

The 1936 book of A.S.T.M. Standards, in two volumes, presents all of the standard specifications, methods of testing, definitions and recommended practices adopted formally by the society. The book is published triennially, with a supplement issued in each intervening year containing standards adopted during that year.

The two volumes of the 1936 book, designated Part I and Part II, include reference to many subjects of interest to the railway field. Together, they contain 516 standards. Part I, which contains 910 pages, includes 181 standards, 109 of which relate specifically to ferrous metals, including steel, wrought iron, iron castings and ferro-alloys, while 60 relate to non-ferrous metals, including aluminum, magnesium alloys, copper and copper alloys, lead, nickel, zinc, bearing metals and electrical-heat and electrical-resistance alloys. Part II, which contains 1,480 pages, includes 335 standards, and deals exclusively with non-metallic materials, such as cement, concrete and concrete aggregates, brick, coal, timber and timber preservatives, paint and other painting materials, petroleum products and lubricants, waterproofing and roofing materials, refractories and fire brick, and electrical insulating materials.

Each volume contains a complete subject index, and, in addition, each has two tables of contents, one a listing of the standards by the materials covered, and the other a listing of the standards in numerical sequence of their A.S.T.M. serial designations.

NEWS

Hearings Resumed in Senate Probe

Wheeler committee continues
inquiries regarding Van
Sweringen companies

Hearings in connection with the investigation of railroad finance being conducted by the Senate committee on interstate commerce were resumed at Washington on January 13, when Chairman Wheeler of the committee continued his inquiries regarding transactions of the various Van Sweringen companies. J. R. Swan, former president of the Guaranty Company, was questioned as to details in connection with an issue of \$30,000,000 of five-year 6 per cent gold notes of the Van Sweringen Corporation sold by a syndicate headed by the Guaranty Company in April, 1930, in connection with the development of real estate holdings of the Van Sweringen brothers at Cleveland, Ohio. Senator Wheeler said that the purchasers of the notes had suffered a loss of about \$15,000,000 through the subsequent decline in the market price and contended that the prospectus had been "falsified" by a "write-up" of the appraisals of the real estate holdings of approximately \$25,000,000 which did not show in the balance sheet of the Cleveland Terminals Building Company, subsidiary of the Van Sweringen Corporation, shortly before. He also brought out that the Guaranty Company had declined to finance the transaction the year before, and that J. P. Morgan & Co. had also declined to take an interest in it. Mr. Swan said, however, that the proposal declined in 1929 was on a very different basis, involving possibly as much as \$60,000,000. He admitted that the note transaction had turned out to be a mistake, but said that the notes had been offered as a "business man's investment for profit."

All of these notes in the hands of the public except \$1,213,000 were retired by December 31, 1931, on the basis of \$500 in cash and 20 shares of Van Sweringen Corporation common stock for each \$1,000 note. The cash funds for this purpose were derived from the proceeds of a \$39,500,000 bank loan extended by six banks to the Van Sweringens in October, 1930, to prevent a threatened collapse of the Van Sweringen enterprises.

Negotiations looking to financing the Van Sweringen holdings in Cleveland were opened with the Guaranty Company in the late spring of 1929, several months before the stock market crash. Several plans,

some involving as much as \$60,000,000, were considered and rejected, as Guaranty Company did not desire to finance the traction and suburban real estate developments because of the large future sums of money that would be necessary for their completion and because of uncertainty as to earnings. These negotiations resulted in 1930 in the plan of financing which was adopted. It was limited to a \$30,000,000 issue; omitted the transit and suburban real estate properties; added \$15,000,000 of marketable securities to the assets of the corporation, and placed the personal credit of the Van Sweringens behind the corporation.

Guaranty Company desired to have the Van Sweringen name behind this financing not only because of the pre-eminent position this name had in the railroad and financial worlds, but also because of the value of the personal guarantee of the Van Sweringen brothers, who were believed at that time to be worth upwards of \$50,000,000. The \$15,000,000 of securities consisted of 500,000 shares of Alleghany Corporation stock with a then market value of \$31 a share. In the ensuing months there was a rapid fall in security prices, and the Van Sweringens were obliged under their personal covenant to increase the shares of Alleghany held by the Van Sweringen Corporation until finally a total of 400,000 additional shares were assigned. Meantime, the Cleveland Terminals Building Company had used a part of the proceeds from the note issue in purchasing stock of the Higbee Company, a department store in Cleveland which rented the department store building constructed as a part of the real estate development. Part of the proceeds and other cash raised by the Cleveland Terminals Building Company were also used in purchasing stocks of industrial companies, notably Otis Steel, Midland Steel Products and White Motors, and some Alleghany common and preferred.

I. C. C. Declines to Dismiss Power Reverse Gear Case

The Interstate Commerce Commission on January 11 denied the petition filed by the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen and Enginemen for a dismissal of their complaint in the power reverse gear case, because an agreement had been reached with the railroads on a plan for equipping locomotives with the power gear. The commission gave no reason for its denial but it was assumed that it desired to make a report following its long hearings in the case.

Budget Would Give I.C.C. More Money

Appropriation of \$7,939,500
is recommended for the
fiscal year 1938

Appropriation of \$7,939,500 for the work of the Interstate Commerce Commission for the fiscal year 1938 is recommended in the Budget transmitted to Congress last week by the President. This is an apparent increase of \$849,950 over the appropriations for the current fiscal year but because unexpended balances amounting to \$157,000 are to be reappropriated the real increase is only \$692,950. An increase of \$750,000 is proposed for expansion in the enforcement of the motor carrier act and an increase of \$40,000 is proposed for expansion of the air-mail contract work, while there is an offsetting decrease of \$100,000 in the amount proposed for valuation work. The commission had asked for an increase of \$1,300,000 for motor regulation.

An appropriation of \$385,765 is proposed for the National Mediation Board, as compared with \$374,500 appropriated for the current year. For the Railroad Retirement Board the estimate is \$2,325,000, as compared with \$47,645,000 allowed for 1937 but it is stated that due to delay in the payment of annuities during the fiscal year 1937 there is sufficient balance in the appropriation to care for all the needs of the board during the fiscal year 1938.

Cancellation of Livestock Charge Suspended

The Interstate Commerce Commission has suspended from January 15 until August 15 the operation of tariff schedules published by the Union Stock Yard & Transit Company proposing to cancel tariffs naming charges for loading and unloading livestock at the Union Stock Yards in Chicago, Ill.

Challenger Speeded Up

The westbound schedule of the Challenger, all-coach tourist sleeping car of the Chicago & North Western-Union Pacific, was speeded up 40 min. between Chicago and Los Angeles, on January 9, thereby reducing the schedule to 60 hr. 15 min. for the 2,298 miles. The train now leaves Chicago at 10:20 p. m., instead of 9:40 p. m., and arrives in Los Angeles, Cal., at 8:35 the third morning, as at present.

Railway Enterprise Persists in Britain

Statement lists innovations of "virile and lively year of progress"

The railways of Great Britain during 1936 "endeavored to meet a virile and lively year of progress by offering improved services," according to the year-end statement issued by the British Railways Press Office.

In promoting their passenger business, the statement says, British roads have made "speed, comfort, safety and dependability the keystones of travel by modern express trains," while at the same time expanding services offered at reduced fares. Penny-a-mile third class round-trip tickets with a 30-day return limit are now a permanent feature of British railway travel and notable success has attended the expansion of "Save to Travel" arrangements by which stamps may be assembled on savings cards, which, when filled, are accepted in payment or part payment for railway tickets. Also, it is pointed out, tourist tickets, circular tour tickets, holiday zone fares and other rate concessions have met real needs of travelers, while dining car patronage has been increased by the introduction of new buffet cars. The camp-coach idea was extended last year so that 300 of these were equipped and available for rental at coastal and inland vacation sites.

There were placed in service in 1936 a total of 2,000 new passenger cars in which "considerable progress was shown in improved standards of interior designs for passenger comfort." Train services generally were expedited and attention is called to the fact that during the August Bank Holiday fortnight a total of 50,000,000 passengers was handled "without the slightest hitch." A new link with the continent was established by the inauguration of channel train ferry service, with through sleeping cars between London and Paris, as described in the *Railway Age* of October 31, 1936, page 626.

On September 30 last year Britain's first streamlined train—the Silver Jubilee of the London & North Eastern—completed its first year's operation between London and Newcastle. During that year this train covered a total of 133,000 miles of which 115,000 were at an average speed of 70 m.p.h. and at least 90,000 at 80 m.p.h. and over. Streamlined rail motor car services were also extended until at the close of last year they covered 3,584 route miles as compared with 1,235 in 1935. Rapid progress was also made in the electrification of main lines in the London suburban area where work was completed on about 95 route miles—the equivalent of 242 single track miles.

Meanwhile freight services were speeded up to provide "next day" delivery of merchandise between all important points and widespread use was made of the 11,240 railway containers, which provide door-to-door service with the advantages of reduced packing costs. The experimental

cash-on-delivery service was said to be "growing steadily"; the limit on the value of consignments handled in this service was raised during the year from £40 to £100. In connection with improvement in facilities, last year saw considerable progress because of financial arrangements worked out in an agreement with the government. Included were extensive track, signal and station projects.

Railway-operated air services at the close of the year covered 62 regularly-scheduled flights and involved ticket interchange arrangements whereby passengers could make a journey in one direction by air and return by rail with appropriate fare adjustments. At the close of the year the railway marine services were operating 140 steamships upon which business was stimulated by the devaluation of currencies in continental countries.

"Innovations and new ideas," the statement concludes, "are constantly being tried by the British railways." It points out in this connection that "Easter, Whitsuntide, the Navy Week, county cricket matches, the football season, have been effectively catered for; the requirements of agriculture with its seasonal traffic, the movement of foodstuffs from overseas and the needs of industry with its changing markets, have been anticipated with the closest possible attention. New methods of handling freight, the movement of farms, factories and household goods have been developed."

Santa Fe Slogan Contest

Judges of a slogan contest conducted by the Atchison, Topeka & Santa Fe among its employees awarded first place to "Dedicated to Service," second place to "The Road That Service Built," and third place to "Santa Fe—Service Always, In All Ways." Since the slogans for first and second place were submitted by more than one individual, duplicate prizes were awarded in these instances. Those submitting the first prize slogan were: Mrs. J. P. Hurley, wife of a stenographer in the master mechanic's office at Albuquerque, N. M.; A. R. Greer, secretary to the superintendent at Wellington, Kan.; and C. J. Haggerty, passenger agent at San Francisco, Cal. Each received \$100. The slogan taking second place was submitted by Charles E. Smith, stationary fireman at Slaton, Tex.; A. R. Greer, who also submitted the first place slogan; and R. S. Thompson, train dispatcher at Temple, Tex. Each received \$50. The slogan taking third place was submitted by George J. Howard, a stenographer in the assistant secretary's office at New York, who was awarded \$25.

Perhaps the most impressive fact developed during the contest was that the thousands of Santa Fe employees who participated represented every class of service, including station forces, train and engine men, maintenance of way foremen and laborers, shop forces, all grades and classes of clerical employees and officers. More than 40,000 slogans were submitted. The most slogans submitted by any one individual employee totaled 312, and by any employee and the members of his family 473. Several entered in excess of 100 each.

Open Fight Against Six-Hour-Day Bill

Mid-West Shippers' Advisory Board names committees to enlighten legislators

Pointing out that the proposed six-hour-day bill and other railway legislation would increase railway costs nearly one billion dollars, resulting in drastically higher freight charges, the Mid-West Shippers' Advisory Board, at its annual meeting at Chicago on January 7, appointed a committee in each of the states comprising the board's territory—Illinois, Wisconsin and Iowa—to contact their congressmen and enlighten them upon the effect of such proposals. Prior to the appointment of these committees the board adopted a resolution opposing the six-hour bill as follows:

"That the Mid-West Shippers' Advisory Board shall oppose in every possible way the proposed six-hour bill for railroad employees as well as any other legislation which has for its end the increase of railroad expenses, and that for the purpose of accomplishing this end special state-wide committees shall be selected and empowered to employ such ways and means as are deemed necessary for bringing to the attention of the public the disastrous effect of such legislation."

M. J. Gormley, executive assistant of the Association of American Railroads, in outlining "Railroad Progress During the Past Decade," discussed the six-hour bill, saying that on the basis of traffic at the 1930 level the 30-hour week would increase railroad operating costs \$547,000,000 annually, which means additional freight charges of \$10 to \$15 for every car loaded. Mr. Gormley also proposed that the Interstate Commerce Commission determine the economic practicability of the St. Lawrence waterway project before its possibilities are turned over to army engineers. He showed how the St. Lawrence waterway would compete with the government's Mississippi barge system.

Another important action taken by the board was a decision to establish a claim prevention month in March.

Reports of commodity committees forecast an increase of 9.1 per cent in loadings during the first quarter of 1936, as compared with the same period in 1935. A total of 802,593 cars will be required, as compared with 735,569 cars actually loaded in the first quarter of last year. Increases in the loadings of various commodities are expected to range from 5 to 65 per cent, and only in a few commodities, mostly agricultural, are decreases expected.

Pennsylvania Garden Club

The Pennsylvania Railroad Garden Club has recently been formed with the object of promoting and cultivating interest in the growing of flowers by that road's employees and their families. The new organization was inspired by the successful flower show held last fall in the Pennsylvania Station, Philadelphia, Pa.

J. M. Davis Lauds Railways' Record

Calls the industry a "notable example of efficiency of private enterprise"

Citing the railroad industry as "a notable example of the efficiency of private enterprise," J. M. Davis, president of the Delaware, Lackawanna & Western, said in an address on January 14 at the annual dinner of the Central Railroad Club of Buffalo (N. Y.) that "the most stabilizing support received by the government during the depression came from industries which to the limit of their ability 'kept going' in the face of obstacles, many of which originated with government itself." Mr. Davis pointed out in detail how the railroads are striving to promote permanent recovery and expressed the hope that the American people would evolve a method of preventing industrial inactivity of long duration.

Asserting that the carriers have "raised their standards of efficiency to a degree never before achieved," the speaker proceeded to cite instances wherein they have at the same time promoted business recovery. They have, he said in this connection, "borne the sole cost of the innovations introduced into their transportation services while on the other hand newer agencies have received the benefits of governmental assistance in many respects." With funds derived from taxes paid by railroads, Mr. Davis continued, "1,600,000 school children are educated annually," also, the carriers normally purchase 25 per cent of the country's steel output, 22 per cent of the bituminous coal, and "virtually the same percentages of other basic commodities." Such purchases, he added, became "almost nil" at the bottom of business inactivity, but recovery has placed the roads in a position to assume their former roles as large purchasers.

Mr. Davis next pointed out how the railroads have been criticized "for doing too much and for doing too little;" have been accused "of retarding progress while in the same breath they have been accused of undue favoritism towards industries and towards localities." He contended in these connections, that "had it not been for the contribution made by the railroads to the development of the country and to progress in every phase of life, we still would be buying buggy whips instead of drawing rooms as the accoutrements of travel."

Among the railroads' "major achievements" in recent years Mr. Davis listed the repayment of "virtually all" money owed to the government after the war, and the expenditure of four billion dollars for improvements since 1920. With reference to the recent decision of the Interstate Commerce Commission, declining to allow continuance of the freight rate surcharges, he is "unable to predict" from what sources the railroads will be able to secure revenues to offset the resulting loss, but he hopes that "the gradual recovery in business will be sufficient to meet

the optimistic expectations of the decision." While Mr. Davis knows of many shippers who were willing to continue paying the surcharges, he referred to others who opposed the railroad application, despite the fact that these same industries had "increased the prices of products that are purchased and used by the railroads." Such an attitude seemed to the speaker "inconsistent, to say the least."

Mr. Davis closed with a discussion of "basic changes which confront us," listing as foremost in this connection the proposed six-hour-day legislation. He doubts that such a law would accomplish what is expected of it by its advocates, fearing rather that "it would be more likely to increase costs of production and costs of living out of proportion to the actual benefit derived;" and to the extent that it would increase costs, he added, these costs must be passed on to the public.

Net for 10 Months Shows Big Increase

Sixty-five roads earned more than fixed charges—51 in comparable 1935 period

Class I railroads for the month of October reported to the Interstate Commerce Commission a net income after fixed charges and other deductions of \$46,233,661, as compared with a net of \$31,380,529 in October, 1935, according to the Interstate Commerce Commission's monthly compilation of selected income and balance-sheet items. For the first ten months of 1936 the net income was \$89,208,327, as compared with a net deficit of \$34,799,764 in the corresponding period of 1935.

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS

Compiled from 138 Reports (Form IBS) Representing 144 Steam Railways
TOTALS FOR THE UNITED STATES (ALL REGIONS)

For the month of October		For the ten months of	
1936	1935	1936	1935
Income Items			
\$89,875,917	\$75,454,504	\$524,652,350	\$396,656,275
11,405,976	11,991,571	118,590,770	125,933,359
101,281,893	87,446,075	643,243,120	522,589,634
1,740,050	1,512,250	16,736,041	14,338,444
99,541,843	85,933,825	626,507,079	508,251,190
11,320,698	11,545,169	111,802,564	112,423,077
40,749,604	41,788,940	413,198,435	418,435,106
235,346	216,653	2,264,034	2,174,052
52,305,648	53,550,762	527,265,033	533,032,235
47,236,195	32,383,063	99,242,046	* 24,781,045
1,002,534	1,002,534	10,033,719	10,018,719
46,233,661	31,380,529	89,208,327	* 34,799,764
16,201,699	16,362,118	161,342,240	162,649,763
3,246,475	2,450,738	22,832,963	15,306,999
453,400	1,231,239	53,771,685	69,455,964
1,184,779	990,060	18,413,186	13,591,171
Selected Asset Items			
13. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707).....		\$681,226,892	\$735,788,331
14. Cash		\$554,918,663	\$436,680,684
15. Demand loans and deposits.....		19,089,247	16,053,106
16. Time drafts and deposits.....		40,350,519	32,121,928
17. Special deposits		109,389,815	65,537,096
18. Loans and bills receivable.....		2,690,689	4,175,706
19. Traffic and car-service balances receivable.....		67,634,268	62,551,980
20. Net balance receivable from agents and conductors.....		54,551,598	49,669,090
21. Miscellaneous accounts receivable.....		148,443,538	137,730,082
22. Materials and supplies.....		294,706,890	281,085,766
23. Interest and dividends receivable.....		30,458,567	34,262,200
24. Rents receivable		2,797,525	2,805,343
25. Other current assets.....		6,471,489	5,435,104
26. Total current assets (items 14 to 25).....		\$1,331,502,808	\$1,128,108,085
Selected Liability Items			
27. Funded debt maturing within 6 months†.....		\$134,606,839	\$251,982,136
28. Loans and bills payable§.....		\$217,826,952	\$345,063,977
29. Traffic and car-service balances payable.....		87,001,672	80,815,252
30. Audited accounts and wages payable.....		234,391,119	225,499,264
31. Miscellaneous accounts payable.....		109,915,614	56,523,904
32. Interest matured unpaid.....		518,583,679	395,363,477
33. Dividends matured unpaid.....		2,366,339	4,647,524
34. Funded debt matured unpaid.....		478,882,803	323,647,871
35. Unmatured dividends declared.....		1,274,268	1,879,881
36. Unmatured interest accrued.....		106,954,433	108,820,290
37. Unmatured rents accrued.....		37,990,562	37,439,827
38. Other current liabilities.....		27,280,683	19,126,483
39. Total current liabilities (items 28 to 38).....		\$1,822,468,124	\$1,598,827,750
40. Tax liability (Account 771):.....			
40-01. U. S. Government taxes.....		\$86,742,424	\$35,838,835
40-02. Other than U. S. Government taxes.....		155,851,321	150,311,641

† The net income as reported includes charges of \$1,566,036 for October, 1936, and \$14,680,239 for the ten months of 1936 on account of accruals for excise taxes levied under the Social Security Act of 1935; also \$4,582,236 for October, 1936, and \$31,912,352 for the ten months of 1936 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress). The net income for October, 1935, includes credits of \$293,592 and for the ten months of 1935 credits of \$7,662,169, on account of reversal of charges previously made for liability under the Railroad Retirement Act of 1934.

§ Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

§ Includes obligations which mature not more than 2 years after date of issue.

* Deficit or other reverse items.

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE \$25,000,000

Name of railway	Net income after deprec.		Net income before deprec.	
	For the ten months of 1936	1935	For the ten months of 1936	1935
Alton R. R.	\$1,171,072	\$2,081,964	\$883,226	\$1,815,756
Atchison, Topeka & Santa Fe Ry. System	5,570,715	5,491,025	14,983,023	15,067,763
Atlantic Coast Line R. R.	902,928	1,699,104	2,667,121	166,530
Baltimore & Ohio R. R.	1,401,058	2,595,152	7,549,872	3,350,295
Boston & Maine R. R.	2,215,866	385,974	852,090	974,553
Central of Georgia Ry.†	1,840,887	1,929,288	1,198,841	1,243,915
Central R. R. of New Jersey	2,572,051	1,673,668	1,301,536	310,768
Chesapeake & Ohio Ry.	34,416,737	24,617,548	41,454,443	31,376,559
Chicago & Eastern Illinois Ry.†	696,985	1,405,987	206,033	900,430
Chicago & North Western Ry.†	9,343,560	10,093,222	5,231,716	5,909,683
Chicago, Burlington & Quincy R. R.	3,373,418	986,155	7,196,630	2,869,824
Chicago Great Western R. R.†	56,047	942,615	476,503	513,200
Chicago, Milwaukee, St. Paul & Pacific R. R.†	12,222,581	16,658,465	7,753,901	12,059,530
Chicago, Rock Island & Pacific Ry.†	12,341,840	12,412,767	8,780,165	8,738,952
Chicago, St. Paul, Minneapolis & Omaha Ry.	1,563,737	2,031,922	1,067,604	1,512,171
Delaware & Hudson R. R.	1,141,151	2,210,096	226,599	1,335,227
Delaware, Lackawanna & Western R. R.	625,891	2,795,367	1,596,728	546,898
Denver & Rio Grande Western R. R.†	3,616,952	3,269,986	2,655,770	2,273,595
Elgin, Joliet & Eastern Ry.	1,198,416	934,674	1,946,134	1,676,842
Erie R. R. (including Chicago & Erie R. R.)	1,674,109	815,295	4,913,672	2,503,470
Grand Trunk Western R. R.	271,249	490,200	659,817	404,832
Great Northern Ry.	6,332,429	5,186,025	9,386,081	8,224,398
Illinois Central R. R.	1,806,604	3,452,343	3,638,019	2,117,420
Lehigh Valley R. R.	1,112,007	1,895,717	3,023,198	55,340
Long Island R. R.	735,104	1,099,287	236,826	99,578
Louisville & Nashville R. R.	7,454,948	3,043,793	10,938,316	6,584,612
Minneapolis, St. Paul & Sault Ste. Marie Ry.	4,613,147	4,370,744	3,595,622	3,409,237
Missouri-Kansas-Texas Lines	809,031	2,795,238	227,507	1,716,343
Missouri Pacific R. R.†	7,707,338	13,048,558	4,194,948	9,530,046
New York Central R. R.†	6,117,663	5,120,979	19,620,923	8,747,676
New York, Chicago & St. Louis R. R.	2,387,547	629,074	3,674,509	1,982,449
New York, New Haven & Hartford R. R.†	4,444,556	2,843,640	1,581,456	45,083
Norfolk & Western Ry.	26,165,420	19,948,181	29,931,650	23,702,199
Northern Pacific Ry.	3,012,116	5,408,819	392,668	2,751,044
Pennsylvania R. R.	29,351,752	18,856,662	47,812,597	37,269,150
Pere Marquette Ry.	1,777,589	948,864	3,888,326	3,092,008
Pittsburgh & Lake Erie R. R.	3,758,569	2,620,934	5,258,185	4,133,032
Reading Co.	5,379,368	4,023,674	8,024,379	6,604,505
St. Louis-San Francisco Ry.†	5,814,232	8,932,233	3,134,196	6,306,760
St. Louis Southwestern Lines†	120,534	541,450	383,882	26,180
Seaboard Air Line Ry.†	5,419,517	6,329,204	3,850,835	4,766,193
Southern Ry.	2,500,899	2,505,193	5,207,417	37,323
Southern Pacific Transportation System†	8,188,250	383,859	14,702,756	6,776,766
Texas & Pacific Ry.	1,383,833	902,356	2,356,096	1,908,294
Union Pacific R. R.	14,144,786	12,221,846	19,531,855	17,560,511
Wabash Ry.†	1,865,604	2,480,651	90,391	677,580
Yazoo & Mississippi Valley R. R.	171,803	971,677	612,897	530,262

† Report of receiver or receivers.

‡ Report of trustee or trustees.

§ Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.

|| Includes Boston & Albany, lessor to New York Central R. R.

¶ Includes Southern Pacific Company and Texas & New Orleans R. R. The operation of all separately operated solely controlled affiliated companies, resulted in a net deficit of \$2,875,500 for ten months of 1936 and \$3,221,566 for ten months of 1935. These figures are not reflected in this statement.

* Deficit.

Eighty-seven roads reported a net income in October, while 48 reported deficits, and for the ten months' period 65 roads reported a net income. For the ten months' period in 1935 only 51 roads reported a net income. The consolidated statement and a statement of the net income of the roads having annual operating revenues above \$25,000,000 are given in the accompanying tables.

Tap Room Added to Banner Blue Limited

A combination dining-tap room car has been added to the consist of the Banner Blue Limited of the Wabash, operating between Chicago and St. Louis, Mo. The car is divided into two sections by an aluminum screen partition, and seats 24 in the dining room and 12 in the tap room. It is equipped with special truck springs and snubbers to eliminate platform and vestibule noises.

J. M. R. Fairbairn Addresses New England Railroad Club

More than 300 members and guests of the New England Railroad Club assembled at a regular meeting on January 12, at the Hotel Touraine, Boston, Mass., to hear J. M. R. Fairbairn, chief engineer of the

Canadian Pacific, discuss "The Importance of Track Structure in Railroad Transportation." Mr. Fairbairn, stressed the importance of a sound, dry roadbed; high-quality ballast; sound, treated ties; heavy tie plates and an adequate rail section. He cautioned, however, that greatest economy required that the character of the track be varied with the demands of traffic. He saw in the present fundamental design and make-up of the track structure the answer to every requirement of modern traffic and speed, and expressed keen interest in the experiments here with continuous welded rails, which practice, he said, if successful, will go a long way toward better track and lower maintenance cost.

Suit Filed for Violation of Motor Carrier Act

United Motor Transportation, Inc., Paterson, N. J., a common carrier by motor vehicle, operating in the interstate transportation of property between Paterson and Pennsylvania and New York points, was on January made defendant in a criminal information filed by John J. Quinn, United States attorney for the district of New Jersey, at Trenton, before United States District Judge Phillip

Forman. The charge was made that during the months of April to October, 1936, both inclusive, the defendant carrier engaged in interstate transportation operations without having filed with the Interstate Commerce Commission, or published, a tariff of its rates or charges, in violation of Section 217 of the motor carrier act, 1935. George Hauck, president of the concern, and Mitchell Lendman, treasurer and general manager of the carrier, were also named as defendants.

The defendants have been ordered to plead at Trenton on January 22.

Bus Service Available to I. C. Suburban Passengers

The Illinois Central, on January 1, under an arrangement with the Chicago Motor Coach Company, made bus service available to its suburban passengers. For 10 cents more than the regular round-trip fare, suburban passengers may purchase round-trip tickets which will include transfer to motor coaches for transportation in the territory bounded by North avenue, Western avenue, Cermak road and the lakefront. The combination round-trip tickets are sold at all suburban stations and transfer to motor coaches may be made at the Roosevelt Road, Van Buren Street or Randolph Street stations.

Railway Employment up 10 Per Cent in December

A total of 1,081,017 employees as of the middle of the month of December was reported to the Interstate Commerce Commission by the Class I railroads, excluding switching and terminal companies. This was an increase of 10.05 per cent as compared with the number in December, 1935, although it was a decrease of 1.01 per cent as compared with the number in November. The number of employees in train and engine service showed an increase of 13.45 per cent in December as compared with the number a year before. The maintenance of equipment and stores group showed an increase of 12.18 per cent.

Club Meetings

The New York division, Railroad Enthusiasts, Inc., will hold its next meeting on Friday evening, January 22, at 7:45 p.m. in Room 2726, Grand Central Terminal, New York. The announcement states that a program "devoted largely to steam locomotives" has been prepared. The division is arranging with the New York, New Haven & Hartford for a special excursion, tentatively set for Sunday, February 14, on a train hauled by one of that road's new streamlined steam locomotives.

The 29th annual dinner of the Traffic Club of Philadelphia, Pa., will be held on Tuesday, January 19, at the Bellevue-Stratford Hotel in that city. The speaker will be H. L. Andrews, vice-president, General Electric Company, while Calvin O. Althouse will act as toastmaster.

This month's meeting of the Pacific Railway Club was held Thursday evening, January 14, in the auditorium of the Key System building, 2129 Grove Street, Oakland, Cal. Walter Bohnstengel, assistant

engineer of tests, Atchison, Topeka & Santa Fe, and Edwin Brooker, metallurgical engineer, Standard Oil Company, spoke on "The Value of Research and Tests to Railways and Industry."

The Traffic Club of Pittsburgh will hold its thirty-sixth annual dinner in the William Penn Hotel, Pittsburgh, Pa., on Friday, January 22. Dr. Neil Carothers of Lehigh University, Bethlehem, Pa., will be the speaker. Plans are being made for the attendance of more than 1,600 industrial and railroad executives.

Unions Meet to Discuss Wage Demands

Representatives of the Big Five Brotherhoods gathered at Chicago on January 12 to formulate a joint program for a wage increase and changes in working rules. At the time of going to press, group and sub committee meetings were still being held preliminary to a general committee meeting which will draft a program for the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Order of Railway Conductors, the Brotherhood of Railroad Trainmen and the Switchmen's Union of North America. Because of precedent, and the facility with which it can be applied, a demand for a horizontal percentage increase is expected.

Fairweather Heads Canadian Railway Club

S. W. Fairweather, director of the bureau of economics, Canadian National, was elected president of the Canadian Railway Club at the annual meeting in Montreal. Alec. McDonald, first vice-president in 1936, who was prevented by ill health from continuing on the executive and succeeding the retiring president, was unanimously elected "president emeritus."

Other officers chosen were: First vice-president, W. S. Emery, superintendent of communications, C. P. R.; second vice-president, E. P. Mallory, executive assistant to the president, C. N. R.; members of executive board: K. B. Thornton, general manager, Montreal Tramways; William Baird, steamship passenger traffic manager, C. P. R.; F. Bengier, assistant mechanical engineer, C. P. R.; C. D. Cowie, treasurer, C. N. R.; J. E. Armstrong, assistant chief engineer, C. P. R.; J. W. Bailey, general foreman, motive power shops, C. N. R.; J. H. Dougherty, general sales manager, Canada Iron Foundries; W. L. Bayer, president, Canadian Bronze Company; B. W. Roberts, general purchasing agent, C. P. R.

Safety Circular for February

The February circular and poster of the Committee on Education Safety Section, Association of American Railroads, are concerned with employee accidents falling within the classification "struck or run over." This, the circular points out, is the most serious cause of fatal injuries to employees; and adds that at this time "struck or run over" fatalities "are increasing faster than others," despite the 50 per cent reduction in the number of employees

thus killed in the five years ended December 31, 1936, as compared with the five years ended December 31, 1926.

It seems to the committee on education that a certain preventative for all accidents from this cause may be summed up as follows: Any job that can as well be done from another place must not be done while on or fouling the track; when necessary to be on or foul a track, form the habit of looking both ways before doing so; obey the rules.

The poster captioned "No Place for Conversation" pictures a railroad yard with four men thus preoccupied while standing on a track with their backs to an approaching locomotive. It also warns that "Unless duty requires never stand between rails."

Pennsylvania and Grand Trunk Start Joint Ferry Service

The Pennsylvania and the Grand Trunk Western have entered into an agreement to operate car ferries jointly across Lake Michigan between Milwaukee, Wis., and Muskegon, Mich., effective January 15. The two roads will also pool their terminal facilities at Muskegon and Milwaukee. With the establishment of the new ferry route the Pennsylvania will operate additional freight trains daily in each direction between Muskegon and Fort Wayne, Ind. At Milwaukee car ferry traffic will be interchanged with the Chicago & North Western, the Chicago, Milwaukee, St. Paul & Pacific and the Minneapolis, St. Paul & Sault Ste. Marie.

Following these arrangements, Pennsylvania passenger trains between Grand Rapids, Mich., and Muskegon will use the Grand Trunk station in Muskegon instead of the Pere Marquette station.

The Wood-Preservers Convention

The American Wood-Preservers' Association will hold its thirty-third annual meeting at the Roosevelt Hotel, New Orleans, La., on January 26-28. In addition to the reports of committees on the more technical phases of wood preservation, reports will also be presented on the service records of crossies, bridge and structural timber, poles, posts and marine piling. The session on Wednesday forenoon, January 27, will, as heretofore, be termed a Users' Day Session and will be devoted to the presentation of papers from users of treated timber on their experiences. At this session, S. C. Kirkpatrick, chief engineer of the Missouri Pacific Lines, Houston, Tex., will speak on Twenty-Five Years Experience with Ties and Timbers from the User's Standpoint. W. B. Gregory, professor of experimental engineering, Tulane University of Louisiana, Tulane, La., will present a history of the Lake Pontchartrain trestle of the Southern Railway, and W. F. Clapp, marine biologist, Duxbury, Mass., will speak on Future Research on the Marine Borer Problems.

A special train will leave Chicago on Sunday forenoon, January 24, via the C. & E. I.-L. & N. railways, with connecting cars from New York, Pittsburgh and St. Louis. The party will visit the plant of

the Indiana Wood Preserving Company at Terre Haute, Ind., on Sunday afternoon, and the plant of the Wood Preserving Corporation at Montgomery, Ala., Monday forenoon, arriving at New Orleans early Monday evening.

Northern Pacific Must Pay for Breach of Construction Contract

The Northern Pacific was ordered by the federal district court at Portland, Ore., on January 4, to pay \$166,652.20 to the Twohy Brothers Company, Spokane, Wash., for breach of a construction contract. The suit was filed nearly seven years ago and submitted by the late Federal Judge Bean to an auditor, Everett Johnson, who later gave his report. The case went to Judge Fee after Judge Bean's death, and came to trial last spring when attorneys reached an agreement to submit testimony taken by the auditor directly to Judge Fee.

The dispute developed over construction of a mountain railroad, mainly for logging purposes, between Headquarters, Ore., and Orofino, Idaho. Under the original contract, the Northern Pacific was to pay the contractors \$1 a car mile for logs hauled before the expiration of the contract on September 1, 1927. On June 1 of that year the company took over the railroad on a "stop work" order and subsequently Twohy Brothers sued for \$691,000 damages, claiming they had not been paid for logs hauled during the period from June 1 to September 1. The railroad claimed that the "stop work" order nullified the portion of the contract on which the plaintiff sued.

Labor and Railroads Consider Compromise Pension Plan

Committees representing the Association of American Railroads and the Railway Labor Executives' Association met at Washington on January 7 at the request of President Roosevelt in an effort to work out a satisfactory plan for a system of retirement annuities for railroad employees. After the meeting it was stated that "matters of mutual interest were discussed but no final conclusions were reached." It is understood that committees were appointed on both sides to report at a later meeting and it is expected that it will be decided to take up also the consideration of other subjects.

The statement issued after the meeting said that "among the matters considered was the railroad retirement act situation" but indicated that that was not the sole purpose by saying that "for the most part the discussion was of a general nature with a view of canvassing the scope of the matters which can be considered at further joint conferences." It is believed that the six-hour-day proposal of the labor organizations will play an important part in the discussions.

Railroad Bills in Congress

In the flood of new and old bills introduced in the opening days of the Congressional session two railroad bills which have received much publicity did not appear during the first week. These are

the six-hour day bill expected to be advanced by the Railway Labor Executives' Association, and the government ownership bill introduced at the last session by Senator Wheeler. Most of the bills on the program of the railroad labor organizations at the last session have been reintroduced.

The full-crew bill was introduced in the Senate by Senator Neely, of West Virginia, as S. 152; the train-limit bill by Senator McCarran, of Nevada, as S. 69; the signal-inspection bill by Senator Barkley, of Kentucky, as S. 29, and the train despatching bill by Senator Wheeler as S. 532. As introduced this year the train-limit bill contains simply a prohibition against the operation of trains consisting of more than 70 cars, exclusive of caboose, without reference to the length of the train. Senator Lonergan, of Connecticut, has reintroduced as S. 19 his bill to enlarge the jurisdiction of the Interstate Commerce Commission relating to the installation, inspection, maintenance, and repair of devices for promoting the safety of railroad operation.

Senators Andrews, of Florida, Johnson, of Colorado, and Austin, of Vermont, have been appointed members of the Senate committee on interstate commerce in place of three Republican former members who were not re-elected to the Senate.

Applicability of Jones Rule to Lumber Shipments

In an action by shippers of lumber from points in the South and Southwest to points North against the Louisville & Nashville for reparation for alleged overcharges the question was whether the "Jones" or "Combination Rule" applied to the shipments. The rule provides: "Where no published through rates are in effect from point of origin to destination on

lumber . . . carloads, and two or more commodity rate factors . . . are used in arriving at the through rate for a continuous rail shipment thereof, such through rate will be arrived at in the following manner. . . ." (Then follows a formula.)

Each of the shipments involved might have been made over a route for which a joint through rate from point of origin to destination had been published. Instead, the shipment was made over a route for which the rate specified in the tariff was a combination rate. The carriers exacted the full combination rate. The shippers claimed reparation on the ground that the "Combination Rule" applies in every case where no joint through rate has been published over the route selected for the movement. The Interstate Commerce Commission sustained the shippers' claim. 142 I.C.C. 521; 682 I.C.C. 731. The L. & N. and some other carriers refused to comply with the order. This suit was then brought in the Federal court for western Kentucky. There the petition was dismissed. Fed. Supp. 593, and that judgment was affirmed by the Sixth Circuit Court of Appeals.

The latter judgment is now affirmed by the United States Supreme Court, January 4, 1937. The court held that as, in each instance, there was available some through route from point of origin to destination for which joint through rates had been published, the rule, by its terms, did not apply, notwithstanding the Commission's construction. That construction was held not conclusive in this action, which the shippers might have brought without resort to the Commission. Though many carriers had acquiesced in the Commission's construction of the rule, others had protested vigorously and persistently. *W. P. Brown & Sons Lumber Co. v. Louisville & Nashville*. Decided January 4, 1937. Opinion by Justice Brandeis.

* * * *



Commemorating the Golden Anniversary of the "Florida Special"

A birthday cake was recently presented to this New York-Miami, Fla., train at St. Augustine, Fla., upon its arrival on the first trip of its fiftieth season. Charlotte Rogers, of Jacksonville, Fla., is shown presenting the cake to Scott M. Loftin, co-receiver of the Florida East Coast, while other girls, appropriately dressed in costumes of 1888, look on. Standing beside Mr. Loftin is George P. James, general passenger agent of the Atlantic Coast Line. Other railway officers in the group are C. L. Beas, general superintendent, and J. D. Rahner, general passenger agent of the F. E. C.

Equipment and Supplies

M-K-T \$15,000,000 Program

The Missouri-Kansas-Texas will spend approximately \$5,000,000 for 1,279 freight and passenger cars, inquiry for which was reported in the *Railway Age* of January 2, and \$10,000,000 for track and equipment maintenance. Locomotive shops at Waco, Texas, and Parsons, Kan., are now working with full-time crews on an extensive motive power repair and rebuilding program. Roadway improvement plans call for the relaying of 100 miles of track and an extensive program of reballasting and resurfacing.

Central Vermont Shops to Repair Equipment

At the St. Albans, Vt., shops of the Central Vermont, nearly \$250,000 in outside repair work to locomotives and freight cars has been assigned for this year, according to an announcement made by Edmund Deschenes, vice-president of the Central Vermont. This includes 15 locomotives from the Grand Trunk lines in New England for general repairs and 100 of the Canadian National's American-owned coal cars. About \$8,000 will be spent on each locomotive and \$1,200 on each coal car; a total repair bill of \$240,000, one-half of which will represent labor costs, the remainder being for material. The Grand Trunk-Canadian National repair work is in addition to the regular Central Vermont work at the St. Albans shops.

Boston & Maine and Maine Central \$1,820,000 Program

Fifty-five additional air-conditioned, deluxe passenger coaches will be placed in service by the Boston & Maine and the Maine Central as a part of a \$1,820,000 new equipment and materials order just placed by those two roads. Over \$1,000,000 of the order will be spent in New England, with resultant employment for New England workmen at outside shops as well as at the B. & M. shops, Concord, N. H., and the M. C. shops, Waterville, Me.

The Pullman-Standard Car Manufacturing Company at Worcester, Mass., will build 20 new air-conditioned coaches for the Boston & Maine (as was reported in the *Railway Age* of January 9,) at a cost of \$40,000 each. These coaches will be of the 84-seat type with the latest appointments. Thirty of the present B. & M. all-steel coaches will be modernized, air-conditioned and have new deluxe seats and modern flooring and lighting installed at the B. & M. shops at Concord, N. H., and five all-steel coaches of the M. C. will be similarly modernized at its shops at Waterville, Me.

The re-conditioned coaches from the shops of the two railroads will commence to go into service in the spring, and the new cars from Pullman-Standard are expected to be ready for service this summer. Both the new and the re-conditioned

deluxe coaches will embody many new comforts in railroad passenger travel. They will be decorated in various color schemes, with the re-conditioned coaches being finished and upholstered in blues and browns. The new coaches will have an entirely new color scheme.

The orders also include 6,000 tons of rails and accessories for the Boston & Maine and 3,500 tons of rails and accessories for the Maine Central. These orders were reported in the *Railway Age* of January 9.

LOCOMOTIVES

THE ALUMINUM COMPANY OF CANADA is inquiring for one locomotive of the 2-8-2 type.

THE CHICAGO & ILLINOIS MIDLAND, reported in the *Railway Age* of December 26, as inquiring for two locomotives of the 0-8-0 type, has ordered this equipment from the Lima Locomotive Works.

GUAYAQUIL & QUITO, has ordered two locomotives of the 2-8-0 type from the Baldwin Locomotive Works. J. Leimberger, superintendent of motive power, Huigra, Ecuador.

FREIGHT CARS

THE NORTHERN PACIFIC is inquiring for 750 fifty-ton gondola cars, 250 seventy-ton gondola cars and 500 fifty-ton flat cars.

THE NORTH AMERICAN CAR CORPORATION is inquiring for 200 refrigerator cars of 40 tons' capacity.

THE BALTIMORE & OHIO has ordered 1,500 gondola cars from the Bethlehem Steel Company; of these 1,200 will be

52 ft. 6 in. long inside and 300 will be 65 ft. 6 in. long. In the *Railway Age* of December 12, this company was reported as making informal inquiries for this equipment.

THE CHICAGO GREAT WESTERN has ordered 200 seventy-ton hopper cars from the Pullman-Standard Car Manufacturing Company.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is inquiring for 500 box cars. This company was reported in the *Railway Age* of January 9, as contemplating the purchase of this equipment.

PASSENGER CARS

THE BANGOR & AROOSTOOK, reported in the *Railway Age* of December 12 as having received bids on five deluxe coaches and two combination mail and baggage cars, has ordered this equipment from the Pullman-Standard Car Manufacturing Company. Three of the coaches will be arranged with a small kitchen for buffet service.

AIR CONDITIONING

THE CANADIAN PACIFIC is carrying out a large air-conditioning program at its Angus shops in Montreal, according to an announcement by D. C. Coleman, vice-president of the company. A total of 136 cars including standard sleepers, dining cars, tourist sleepers, parlor cars and day coaches will be air conditioned. Having previously carried out similar work on 130 cars in 1936, this road upon completion of its new program, will be in a position to greatly extend its air-conditioned services throughout the Dominion.

* * * *



New Motor Coaches for the Baltimore & Ohio's Train-Connection Services at New York

Twenty-two of these new streamlined, air-conditioned buses have replaced those formerly assigned to train-connection service between the B. & O. terminal in Jersey City, N. J., and the 14 stations in New York City and vicinity and the Newark-Elizabeth route. These motor coaches were especially designed to meet the needs of this service by engineers of the White Motors Company and the B. & O. Streamlining, color and decorative plans follow ideas developed by Otto Kuhler, consultant engineer of designing of the B. & O. The coaches are royal blue in color, trimmed in black dust-proof grey, with gold lettering on the side panels and trade marks.

Supply Trade

John H. Rodger, executive vice-president of the **Oxweld Railroad Service Company**, Chicago, has been elected president.

The Northwest Magnesite Company has appointed **The Celotex Corporation**, Chicago, exclusive sales agent for Thermax structural insulation and Absorbex acoustical corrective. **R. E. Bennett**, of the Thermax Division of The Northwest Magnesite Company, is now connected with The Celotex Corporation.

George W. Sawin, formerly Philadelphia, Pa., district manager of the B. F. Goodrich Rubber Company, Akron, Ohio, has been appointed vice-president and general manager of the **B. F. Goodrich Rubber Company of Canada, Ltd.**, Kitchener, Ont. This appointment fills the position left vacant by the recent death of Frank G. Morley. Mr. Sawin has been for 24 years in Goodrich service.

H. I. Dunphy and **J. H. Van Moss** have been appointed assistant vice-presidents in the sales division, of the **American Car & Foundry Company**, with headquarters at New York; **W. L. Richeson**, previously in charge of sales in the Cleveland, Ohio, district, has been appointed manager of sales with headquarters at New York and **R. A. Williams** has been appointed district sales manager in charge of the Cleveland district.

The plant and property of the **Carnegie-Illinois Steel Corporation**, Joliet, Ill., was transferred to the **American Steel & Wire Company** on January 1, the property included being the splice bar mills, spike mills, merchant mills, and bolt and nut factory. Two blast furnaces and the coke plant will be retained by Carnegie. With the exception of the blast furnaces and the coke plant, the operations formerly conducted by Carnegie will be under the management of the American Steel & Wire Company. Carnegie-Illinois will market the track accessories manufactured at the Joliet works as previously.

Pierce T. Wetter, who for ten years has supervised the technical professional divisions of the American Society of Mechanical Engineers, has resigned to become executive vice-president of **American Cutting Alloys, Inc.**, 500 Fifth avenue, New York. Mr. Wetter will have charge of the company's development in the manufacture and sale of cemented carbide titanium tips and cutting tools, particularly for the cutting of steel at high speeds. He also becomes vice-president and assistant treasurer of the **American Electro Metal Corporation** of Lewiston, Maine, manufacturers of molybdenum and tungsten products.

E. M. Voorhees, vice-president and director of the **Johns-Manville Corporation**, has been appointed vice-chairman of the Finance Committee of the **United States Steel Corporation**. He was also elected a member of the board of directors and will assume his new post in the

United States Steel Corporation on April 1. Mr. Voorhees was born 45 years ago at Amsterdam, N. Y., where he attended high school and was graduated from Dart-

mouth College in 1914. He began his business career with Hollis H. Sawyer & Co., Boston, Mass., later going to Manila, P. I., with the Pacific Commercial Company, an exporting and importing firm; then followed three years with the United States Rubber Company in New York. Before joining Johns-Manville Corporation, Mr. Voorhees was engaged in industrial engineering for William A. Harriman & Co., and Sanderson & Porter. He has been associated with the Johns-Manville Corporation for more than nine years, where he has consecutively served as general auditor, treasurer, secretary, vice-president and director.



E. M. Voorhees

OBITUARY

J. W. Savage, railway sales representative of the DeVilbiss Company, Chicago, died in that city on December 31 of pneumonia.

Eugene N. Strom, who retired as vice-president of the Pettibone-Mulliken Company, Chicago, in 1928, died in Golden Beach, Fla., on January 11, after an illness of a year and a half.

Howard J. Evans, in charge of railroad sales for The Lunkenheimer Company, Cincinnati, Ohio, died on January 5, at St. Petersburg, Florida, after an illness of several weeks. Mr. Evans was a native of Cincinnati and had been associated with The Lunkenheimer Company since 1900.

Charles H. Dickerman, representative in the sales department of the International Business Machines Corporation, at Philadelphia, Pa., and a son of William C. Dickerman, president of the American Locomotive Company, died suddenly on January 11, of a heart attack at the Philadelphia Country Club. Charles H. Dickerman was born 27 years ago at Mamaroneck, N. Y., and after attending schools was graduated from Phillips Academy, Andover, Mass., in 1927. Four years later he received the Ph. B. degree from Yale University and then attended the Harvard School of Business Administration, gradu-

TRADE PUBLICATIONS

SYLPHON CONTROL.—The Fulton Sylphon Company, Drexel building, Philadelphia, Pa., has issued two four-page folders descriptive of the Sylphon control of passenger-car heating and the Sylphon control on ice-activated cars. It was incorrectly stated in the December 19 issue that these were 40-page bulletins.

THE UNION TRAIN COMMUNICATION SYSTEM.—The Union Switch & Signal Company has now completed its experiments with telephone communication between the front and rear of long freight trains, and has issued a handsome illustrated bulletin, No. 153, giving a schematic diagram of the apparatus as fixed on a caboose or a locomotive (both alike) and setting forth the advantages to be derived from using a communication of this kind. As the reader knows from previous descriptions, this plan of communication applies under any circumstances, whether the train is long or short, whether moving or standing still, or parted. According to the bulletin, no license is required from the Federal Communications Commission, and communication is private. Provision is made for communication also with stations or signal cabins and between two trains which are on the same or adjacent tracks. The communication is two-way and therefore can be utilized in hump yard operations.

NX SYSTEM OF INTERLOCKING.—The General Railway Signal Company, Rochester, N. Y., has issued a bulletin (No. 167) with this title, dealing with its system of electric interlocking with CTC machines where a single signal is cleared for a movement through two, three or more switches, simplifying the leverman's work and often effecting considerable saving in time. The letters N and X stand for entrance and exit; the entrance and exit of a route which may lead through a combination of crossovers; and an operator, even an inexperienced one, has to concern himself only with where the train is coming from and whence it is going. From the leverman's point of view, it is like a similar simplification that is, or was, in use on the Northern of France, with hydraulic interlockings. The G.R.S. machines even select automatically an alternative route where, of two combinations, the one first desired or chosen is in use for some other movement.

Construction

NEW YORK CENTRAL.—The New York Public Service Commission has approved a low bid submitted by Metzger Construction Corp., Buffalo, N. Y., of \$138,487 for the elimination of the Sheridan Drive crossing of this road in the town of Tonawanda, N. Y. The commission directed the railroad to award the contract.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Motor Acquisition.*—Examiner Robert R. Hendon of the Interstate Commerce Commission in a proposed report has recommended that the Southern Kansas Stage Lines be permitted to purchase the property and operating rights of the Topeka-Emporia Truck Line, subject to the condition that such steps will be promptly taken as are legally possible and necessary to effect acquisition by the Atchison, Topeka & Santa Fe from the General Improvement Company of all interest which the latter owns in the Southern Kansas Stage Lines.

BALTIMORE & OHIO.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation and the Interstate Commerce Commission for an extension to April 1, 1942, of loans from the R. F. C. amounting to \$14,494,423 maturing in 1937.

BOSTON & MAINE.—*Loan Extension.*—This company has made application to the Reconstruction Finance Corporation for a two-year extension of its \$7,569,437 loan maturing February 1. At the same time the company notified the Interstate Commerce Commission that it would seek a similar extension of \$5,500,000 of bank loans, due at the same time.

CHICAGO, HAVANA & WESTERN.—*Bonds.*—This company has asked the Interstate Commerce Commission for authority to extend the maturity date of \$2,500,000 of first mortgage bonds from December 1, 1926, to April 2, 1952.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Bondholders' Committee.*—A protective committee to represent the holders of this company's first and general mortgage series A and B bonds, due 1966, was formed in New York on January 7 under the chairmanship of R. D. Alsop, of the law firm of Hunt, Hill & Betts, 120 Broadway, New York.

DULUTH, SOUTH SHORE & ATLANTIC.—*Bankruptcy.*—This company has filed a petition for reorganization under the federal bankruptcy laws in the federal court at Minneapolis.

ERIE.—*Bond Redemption.*—J. P. Morgan & Co., sinking fund trustees for this company's 4 per cent Pennsylvania collateral bonds, due 1951, have called all outstanding bonds of this issue for redemption February 1 at a premium of 5 per cent.

FLORIDA EAST COAST.—*Sale of Key West Extension.*—The Key West Extension of this line, destroyed in part by a hurricane, has been sold to a state toll bridge commission for \$640,000.

GREAT NORTHERN.—*Bonds.*—Morgan, Stanley & Co. and associated financial houses have offered, subject to the approval of the Interstate Commerce Commission, \$50,000,000 of 3¾ per cent series I general mortgage bonds of this company priced at 97½ to yield 3.89 per cent.

Proceeds of the issue, together with funds in the treasury, will be used to redeem \$61,028,000 of prior lien bonds (\$10,185,000 Montana Extension first mortgage bonds and \$10,000,000 Montana Central first mortgage bonds, both issues maturing within the next six months; and \$40,843,000 of St. Paul, Minneapolis & Manitoba consolidated mortgage bonds, to be called for redemption July 1 at 101½). The underwriters are paying the railroad 95½ for the new issue.

MISSOURI PACIFIC.—Reorganization.—The Interstate Commerce Commission, Division 4, has postponed the hearing on the debtors' plan of reorganization from January 12 to March 9. The hearing will be held before Director O. E. Sweet of the commission's Bureau of Finance at Washington, D. C.

MISSOURI PACIFIC.—Reorganization.—The Interstate Commerce Commission, Division 4, has denied the application of Roland C. Behrens, Oliver M. Clifford, and A. F. Greer, as a protective committee for holders of the first mortgage 4 per cent gold bonds, due July 1, 1939, of the Little Rock & Hot Springs Western, for authority to solicit authorizations to represent holders of such bonds and to use, employ, or act pursuant to such authorizations and in accordance with the terms of a deposit agreement.

MONTOUR.—Equipment Trust Bonds.—This company has asked the Interstate Commerce Commission for authority to issue \$700,000 of 2½ per cent equipment trust bonds to be sold to the Union Trust Company of Pittsburgh, Pa.

ST. LOUIS SOUTHWESTERN.—Bonds.—This company has asked the Interstate Commerce Commission for authority to assume and guarantee payment of part or all of the interest and principal of \$5,000,000 of proposed first mortgage bonds of the Union Terminal Company.

TOLEDO, PEORIA & WESTERN.—Bonds.—W. E. Hutton & Co. have offered \$1,600,000 of first mortgage series B 4 per cent bonds of this company, due 1967, at 102—the proceeds to be used to redeem an outstanding issue of 6 per cent bonds at 103.

WESTERN PACIFIC.—Equipment Trust Certificates.—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of \$2,320,000 of 3 per cent equipment trust certificates.

Average Prices of Stocks and Bonds

	Jan. 12	Last week	Last year
Average price of 20 representative railway stocks..	55.12	53.95	45.01
Average price of 20 representative railway bonds..	85.94	84.64	78.63

Dividends Declared

Pittsburgh Bessemer & Lake Erie.—75c, semi-annually, payable April 1 to holders of record March 15.

Pittsburgh Cincinnati, Chicago & St. Louis.—\$2.50, payable January 20 to holders of record January 9.

West Jersey & Seashore.—\$1.50, semi-annually, payable July 1 to holders of record June 15.

Railway Officers

EXECUTIVE

D. J. O'Connell, special accountant on the Elgin, Joliet & Eastern, has been appointed assistant to the president, with headquarters as before at Chicago.

E. E. McCarty, who has been appointed assistant to the vice-president in charge of operation of the Atchison, Topeka &



E. E. McCarty

Santa Fe, as reported in the *Railway Age* of January 9, was born on March 20, 1881, and has been identified with the Santa Fe for 37 years. He first entered the service of this company as an agent on the Los Angeles division, later being promoted through the positions of train dispatcher, chief dispatcher, general inspector of transportation and trainmaster. He was first appointed to the latter position in 1912, serving on the Albuquerque, Los Angeles and Arizona divisions until 1926, when he was appointed acting superintendent of the Albuquerque division. Six months later he was appointed superintendent of the same division. On October 1, 1932, Mr. McCarty was advanced to assistant general manager of the Western lines, with headquarters at La Junta, which position he was holding at the time of his recent appointment as assistant to the vice-president, effective January 10. Mr. McCarty's new headquarters are at Chicago.

FINANCIAL, LEGAL AND ACCOUNTING

Stephen W. Dill has been appointed chief claim agent of the New York Central System, with headquarters at New York. Mr. Dill was born in Orange county, New York, and educated in the public schools. He entered the service of the New York, Ontario & Western in 1898 as telegraph operator and agent, and served in various capacities on that road until June 1, 1908, when he resigned to enter the service of the transportation department of the New York Central & Hudson River (now New York Central). Mr. Dill became claim agent for that road

on March 1, 1911, and district claim agent at New York on January 23, 1917. On July 1, 1919, he was appointed assistant chief claim agent at New York, the position he held until his recent appointment.

Howard I. Bunney, acting auditor of the Montana, Wyoming & Southern, with headquarters at Belfry, Mont., has been appointed auditor of this company.

E. O. Hemenway, who has been connected with the engineering department of the Atchison, Topeka & Santa Fe for 22 years, has been appointed land commissioner with headquarters at Albuquerque, N. M., succeeding the late W. B. Collinson. Mr. Hemenway's appointment became effective on January 1.

Dwight Campbell, former justice of the supreme court of South Dakota, has been appointed solicitor of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Aberdeen, S. D., effective January 16, to succeed H. O. Hepperle, who has resigned to enter the private practice of law in California.

Ralph M. Hogin, who has been appointed comptroller of the Atchison, Topeka & Santa Fe at New York, as reported in the *Railway Age* of January 9, was born in Bellville, Kansas, in 1887. He entered the service of the Santa Fe in March, 1914, as clerk in the auditor of disbursement's office at Topeka, Kan., and was transferred to the audit office of the Railroad Administration in Washington on August 1, 1918. Mr. Hogin held the lat-



Ralph M. Hogin

ter position until February 28, 1919, when he was appointed chief clerk to the president of the Santa Fe at Chicago, Ill., which position he held until his present appointment.

OPERATING

P. T. Webber, chief clerk to vice-president of the Railway Express Agency, has been appointed superintendent of organization, Eastern departments, at New York.

William Ruggles Fitzmaurice, superintendent of the Halifax division of the Canadian National, with headquarters at Halifax, N. S., who has retired, as noted in the *Railway Age* of January 9, was

born on March 19, 1870, at Bedford, N. S. He entered railway service on May 21, 1886, as telegraph operator for the Intercolonial Railway (now Canadian National). Mr. Fitzmaurice then served as agent at Oxford Junction, N. S., and Amherst, successively, and in August, 1913, he became assistant superintendent at New Castle, N. B. On September 1, 1916, he became superintendent at Campbellton, N. B., and on April 24, 1920, was transferred in the same capacity to New Glasgow, N. S. He returned in that position to Campbellton on November 2, 1923, and was transferred to Halifax as superintendent of the Halifax division on February 1, 1927.

R. B. Teakle, manager of the Canadian National steamships and car ferries, with headquarters at Toronto, Ont., has been appointed general manager of the Canadian National (West Indies) Steamships Limited.

A. J. Chester, general superintendent of the Texas & Pacific, has been promoted to general manager with headquarters as before at Dallas, Tex., to succeed **H. D. Earl**, who died on June 30, 1936. The position of general superintendent has been abolished.

J. A. Gillies, superintendent of the Colorado division of the Atchison, Topeka & Santa Fe, with headquarters at Pueblo, Colo., has been promoted to assistant general manager of the Northern district of the Western lines, with headquarters at La Junta, Colo., succeeding **E. E. McCarty**, whose appointment as assistant to the vice-president in charge of operations, with headquarters at Chicago, was reported in the *Railway Age* of January 9. **D. Trahey**, trainmaster at Clovis, N. M., has been promoted to superintendent of the Panhandle division, with headquarters at Wellington, Kan., to succeed **J. C. Barton**, who has been transferred to the Colorado division at Pueblo to replace Mr. Gillies. **J. F. Carder**, trainmaster at La Junta has been transferred to Clovis, N. M., to succeed Mr. Trahey and **W. S. Cummings**, chief dispatcher at Dodge City, has been promoted to trainmaster at La Junta, to succeed Mr. Carder.

Ray C. Dodds, assistant superintendent on the Iowa and Kansas City divisions of the Chicago, Milwaukee, St. Paul & Pacific, who has been promoted to superintendent of the Iowa and Southern Minnesota division, with headquarters at Austin, Minn., was born on June 16, 1884, at Shannon, Ill. After a high school education Mr. Dodds entered railway service with the Milwaukee in 1901, serving as a helper and operator on the Iowa and Dakota division until 1903. From that year until 1910 he served as an operator on the Northern Pacific, the Union Pacific and the Chicago, Rock Island & Pacific, then returning to the service of the Milwaukee as an operator on the Iowa and Dakota division. In 1913 Mr. Dodds was promoted to dispatcher and later served as chief dispatcher. From 1924 to 1929 he served as trainmaster on various divisions, then being appointed assistant superintendent of the Iowa and Kansas City divisions,

which position he held until his recent appointment as superintendent of the Iowa and Southern Minnesota division, with headquarters at Austin, Minn.

TRAFFIC

W. J. Lafferty, division passenger agent on the Chicago, Rock Island & Pacific, has been promoted to assistant manager, mail, baggage and express traffic, with headquarters at Chicago, to succeed **J. P. Kilty**, whose promotion to assistant general passenger agent was reported in the *Railway Age* of January 9.

J. W. Brennan, general agent of the Chicago, Burlington & Quincy at New York, has been appointed eastern traffic manager with the same headquarters, with jurisdiction over general agencies at New York, Boston, Philadelphia and Washington. **J. W. Fletcher** has been appointed general agent at New York, to succeed Mr. Brennan.

E. A. Coons, general agent, freight department, Union Pacific, has been appointed assistant freight traffic manager, with headquarters as before at Los Angeles, Cal. **W. F. Nash**, general agent at San Pedro, Cal., has been transferred in the same capacity to Riverside, Cal., succeeding **R. E. Drummy**, who succeeds Mr. Coons as general agent, freight department, at Los Angeles. **Otto Nilson** has been appointed general agent at San Pedro, succeeding Mr. Nash. **K. G. Carlson** has been appointed general agent, freight department, at Sioux City, Iowa, succeeding **C. A. Pollock**, who has been transferred in the same capacity to Chicago.

C. F. Farmer, who has been appointed freight traffic manager of the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., as noted in the *Railway Age* of January 9, was born at Newark, Ohio, on March 3, 1889, where he was educated in the public schools, later attending business college. Mr. Farmer entered the service of the Baltimore & Ohio as a truckman on September 1, 1909, becoming transfer

ice on March 15, 1918. Returning to the Baltimore & Ohio on September 1, 1919, Mr. Farmer was appointed commercial representative, becoming freight representative on March 1, 1920, and division freight agent at Youngstown, Ohio, on June 6, 1920. On June 1, 1928, he was promoted to assistant general freight agent at Cleveland and on December 1, 1929, he was appointed general freight agent in charge of perishable freight traffic on the system, at Baltimore. Mr. Farmer was promoted to assistant freight traffic manager at St. Louis on April 1, 1931, the position he held until his recent appointment.

Howard G. Settle, who has been appointed assistant freight traffic manager of the Baltimore & Ohio at Baltimore, Md., as noted in the *Railway Age* of January 9, was born on July 24, 1882, in Columbus Township, Hamilton County, Ohio. He was educated in the public schools and at Ohio State University, and entered the service of the Baltimore & Ohio Southwestern (now Baltimore & Ohio) as mes-



H. G. Settle

senger in the general freight office at Cincinnati, Ohio, in February, 1900. After holding various clerical positions in the claim, tracing and rate departments, he was appointed chief clerk in the general freight office on December 20, 1915. He was promoted to division freight agent at Chillicothe, Ohio, on August 1, 1919, and was transferred to Seymour, Ind., on September 15, 1921. Later, upon the consolidation of the Indiana and Illinois divisions, he was transferred to Washington, Ind. On June 1, 1922, Mr. Settle was appointed assistant general freight agent at Baltimore to take charge of the handling of complaints before the Interstate Commerce Commission involving freight rates other than coal, which position he held until July 15, 1930. On the latter date Mr. Settle was appointed general freight agent, the position he held until his recent appointment. During the period he was in charge of commerce work, he testified before the Interstate Commerce and State Commissions in numerous rate cases, representing the Baltimore & Ohio and other Eastern lines, and was admitted to practice before the Interstate Commerce Commission on February 10, 1930.

Paul Stetson Phenix, who has been appointed assistant freight traffic manager



C. F. Farmer

clerk on April 1, 1910, and car clerk on March 6, 1912. After serving in various other clerical capacities until July 1, 1916, he was appointed traveling dairy freight agent, being furloughed for military serv-

of the Baltimore & Ohio, with headquarters at New York, as noted in the *Railway Age* of January 9, was born at Portland, Me., on January 8, 1894. He entered the service of the Baltimore & Ohio on June 1, 1917, as a special agent in the bureau of industrial surveys, commercial develop-



Paul S. Phenix

ment department. On January 4, 1918, Mr. Phenix was furloughed for military duty, returning to the Baltimore & Ohio on March 1, 1920, as industrial survey agent. He was promoted to division freight agent at Cumberland, Md., on July 1, 1921, and was transferred to New York in a similar capacity on May 16, 1922. He was appointed assistant general freight agent at New York on June 1, 1925, and general New England agent at Boston, Mass., on February 16, 1928, the position he held at the time of his recent appointment.

John C. Kimes, general freight agent on the Baltimore & Ohio, with headquarters at Chicago, whose promotion to assistant freight traffic manager with the same headquarters was reported in the *Railway Age* of January 9, was born at Monongahela City, Pa. He entered railway service at the age of 16 years as a messenger on the Baltimore & Ohio at Rankin, Pa., and has served with this road



Moffett

John C. Kimes

continuously except for a period during the World War when he was in military

service. Mr. Kimes was advanced successively through the positions of yard clerk, bill clerk, rate clerk, cashier and agent until 1906, when he entered the traffic department as soliciting freight agent at Pittsburgh, Pa. Four years later he was advanced to commercial freight agent and in October, 1916, he was appointed division freight agent. In 1918 Mr. Kimes was granted a leave of absence to serve in the ordnance department of the United States Army, returning to railroad service on March 1, 1919, as division freight agent on the Baltimore & Ohio at Cincinnati, Ohio. On March 1, 1920, he was promoted to assistant general freight agent at Cleveland, Ohio, and on June 1, 1928, he was further advanced to general freight agent, with headquarters at Chicago, which position he held until his recent appointment as assistant freight traffic manager.

G. Murray Campbell, who has been appointed assistant coal traffic manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., as noted in the *Railway Age* of January 9, was born on January 30, 1896. Mr. Campbell entered the service of the Baltimore & Ohio in 1916 as a timekeeper in the engineering department,



G. Murray Campbell

but was furloughed during the war. He returned to that road in September, 1921, as clerk in the general freight department, becoming rate clerk on May 20, 1922. On July 1, 1924, he was advanced to traveling industrial agent, with headquarters at Pittsburgh, Pa., from which position he was advanced to district freight representative at Jacksonville, Fla. Mr. Campbell was promoted to district freight agent at Toledo, Ohio, on January 16, 1929, and was appointed Northwestern freight agent at Minneapolis, Minn., on October 1, 1930. He was appointed assistant general freight agent at Washington, D. C., on March 7, 1933, the position he held until his recent appointment.

Raymond W. Anderson, who has been appointed general coal freight agent of the Baltimore & Ohio, as noted in the *Railway Age* of January 9, was born at Big Run, Pa., on August 20, 1895. He received his early education in the public schools of Big Run and later was graduated from the Clarion State Normal School in Clarion, Pa. After teaching school for three

years at Curwensville, Pa., Mr. Anderson entered the service of the Buffalo, Rochester & Pittsburgh (now B. & O.) as clerk in the transportation department at DuBois, Pa., in 1916. He was furloughed for service in the World War in 1918 and re-entered the employ of the railroad



R. W. Anderson

in 1919 as cashier in the same department. In 1920 he became traveling freight agent, with headquarters at DuBois and New Castle, Pa., and three years later was appointed chief clerk in the freight traffic department at Rochester, N. Y. Mr. Anderson was appointed assistant general freight agent at Rochester in 1928 and became coal traffic manager there in 1930. He was appointed coal freight agent at Pittsburgh on February 16, 1932, from which position he was recently promoted.

C. M. Gosnell, who has been appointed general coal freight agent of the Baltimore & Ohio at Baltimore, Md., as noted in the *Railway Age* of January 9, was born at Sykesville, Md., on May 30, 1887. He was educated in Baltimore public schools, Baltimore Polytechnic Institute, Eaton and Burnett's Business College and later was graduated with an LL.B. from the University of Maryland. Mr. Gosnell entered the service of the Baltimore



C. M. Gosnell

& Ohio as messenger in the general freight department at Baltimore on October 2, 1903, becoming stenographer in that office on June 1, 1905, and on October 1, 1909,

was appointed secretary to the general coal and coke agent. On September 1, 1916, he was promoted to traveling coal freight agent, two months later becoming chief clerk of the coal traffic department. On March 22, 1920, Mr. Gosnell was appointed industrial agent at Pittsburgh, being advanced to division freight agent at Akron, Ohio, on June 15, 1922. He was transferred in a similar capacity to Baltimore on February 15, 1924. On September 1, 1930, he was appointed assistant general freight agent at Baltimore and on April 1, 1932, was appointed assistant general coal freight agent, the position he held until his recent appointment.

William Earl Stewart, who has been appointed general freight agent of the Central of Georgia, with headquarters at Savannah, Ga., as noted in the *Railway Age* of January 9, was born on August 10, 1883, at Madison, Ga. He received his education in Lanier High School and Mercer University, Macon, Ga., and entered railroad service on May 7, 1902, as night seal clerk in the yard office of the Central of Georgia at Macon. He was transferred to the traffic department on January 12, 1905, as chief clerk to the claim agent at Macon. On December 1, 1906, he was pro-



William E. Stewart

moted to soliciting agent and on August 1, 1907, he was transferred to the railroad's general headquarters at Savannah as solicitation clerk in the general freight office. On August 15, 1909, Mr. Stewart became commercial agent at Chattanooga, Tenn., and on August 1, 1914, was promoted to division freight and passenger agent, with the same headquarters. During the period of federal operation of the railroads Mr. Stewart served from May 1, 1918, to March 1, 1920, as chief clerk to the Southern Export Committee at Atlanta. On the latter date he resumed the position of division freight and passenger agent for the Central of Georgia and on August 1, 1920, became assistant general freight agent at Macon, which position he held until his recent appointment.

Charles H. Gattis, who has been appointed assistant passenger traffic manager for the Seaboard Air Line, with headquarters at Norfolk, Va., as noted in the *Railway Age* of December 26, entered

railroad service as clerk with the Associated Railways of Virginia and the Carolinas in 1894. In 1896 he joined the Seaboard Air Line as clerk in the freight department at Raleigh and two years later



Charles H. Gattis

became city passenger and ticket agent. From June 1, 1905, to February 1, 1910, he served as district passenger agent, resigning on the latter date to undertake the position of general passenger agent with the Georgia & Florida at Augusta, Ga. Mr. Gattis returned to the Seaboard Air Line in 1914 as tourist agent at Raleigh and in 1917 he became general agent of the United States Railroad Administration. When the railroads returned to private operation on March 1, 1920, Mr. Gattis was appointed assistant general passenger agent for the S.A.L. at Norfolk. He was appointed general passenger agent in 1931, the position he held until his recent appointment.

John W. Blount, assistant general passenger agent of the Central of Georgia, with headquarters at Savannah, Ga., has been appointed general passenger agent, with the same headquarters, succeeding **Frederick J. Robinson**, who has been



John W. Blount

appointed to the newly-created position of general agent, passenger traffic department, at Savannah. **T. J. Stewart** has been appointed assistant general passenger agent, succeeding Mr. Blount. Mr. Blount was born on September 29, 1874, at Rome, Ga.,

and received his education in the public and private schools of Macon, Ga. He entered railroad service in November, 1890, with the Central of Georgia as clerk in the baggage department at Macon and served successively as baggage agent, clerk in depot ticket office, passenger agent and city ticket and passenger agent in the same city and later became traveling passenger agent at Birmingham, Ala., and Macon. Mr. Blount was appointed district passenger agent at Macon in November, 1907, and was promoted to division passenger agent there in January, 1916. In January, 1917, he became assistant general passenger agent at Savannah and in January, 1928, was appointed general passenger agent. Mr. Blount was appointed assistant general passenger agent at Savannah in December, 1931, the position he held until his recent appointment.

ENGINEERING AND SIGNALING

John W. Wheeler, a member of the State Highway Commission of the State of Indiana, has been appointed to the newly-created position of engineer highway negotiations of the Chicago, Burlington & Quincy, with headquarters at Chicago.

F. T. Darrow, assistant chief engineer of the Chicago, Burlington & Quincy, lines west of the Missouri river, with headquarters at Lincoln, Neb., has been promoted to chief engineer, effective February 1, with headquarters at Chicago, to succeed **A. W. Newton**, who will retire under the pension rules of the company on that date. Mr. Newton will continue in the service of the company with the title of consulting engineer.

W. R. Gillam, division engineer of the Iowa division of the Illinois Central at Waterloo, Iowa, has been promoted to district engineer of the Southern lines, with headquarters at New Orleans, La., to succeed **M. B. Morgan**, deceased. **H. Rhoads**, assistant engineer at Waterloo, has been promoted to division engineer with the same headquarters, to succeed Mr. Gillam. **J. E. Fanning**, supervisor at Waterloo, has been appointed assistant engineer at that point, to replace Mr. Rhoads.

OBITUARY

James H. O'Neill, general manager of the Great Northern at Seattle, Wash., died at his home at that point on January 13 of a heart attack at the age of 64 years.

William Carlton Mitchell, vice-president of the Susquehanna & New York and the Tionesta Valley, with headquarters at New York, died on January 8, at his home in North Plainfield, N. J., after an illness of three weeks. Mr. Mitchell was 61 years old.

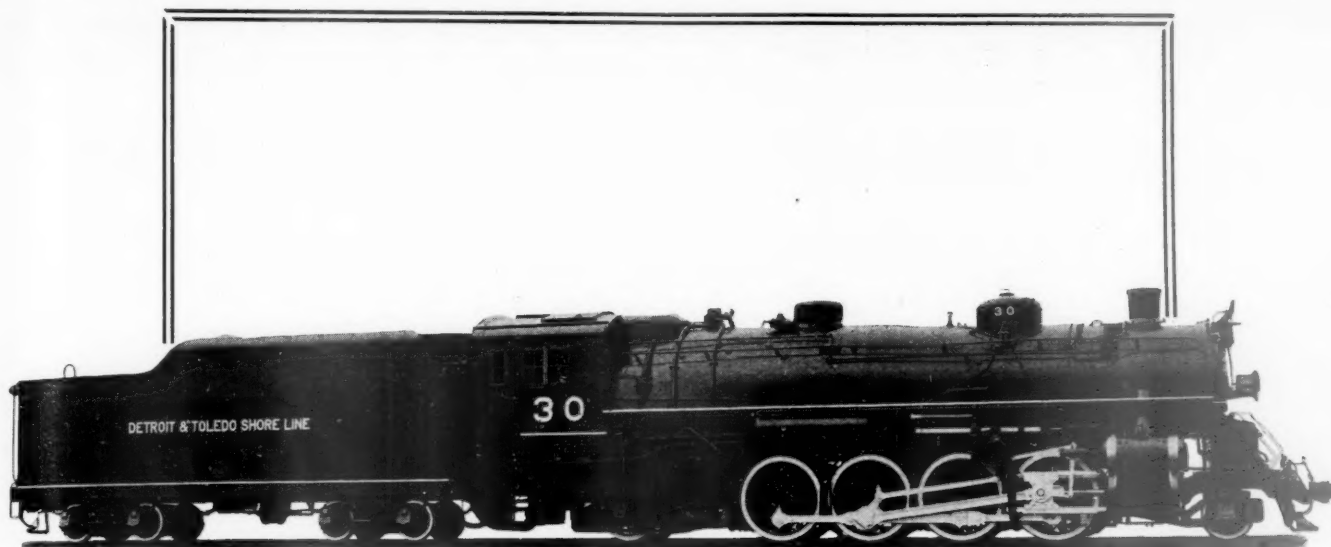
Edward H. Lee, who retired on April 1, 1932, as president of the Chicago & Western Indiana and the Belt Railway of Chicago, died at his home at Chicago on January 11 of a heart attack which followed a brief illness with influenza.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1936

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger (inc. misc.)	Total	Way and structures	Equipment	Traffic	Trans- portation	Total			Operating income	After depr. & retir. 1935
Akron, Canton & Youngstown..... Nov.	171	\$180,047	\$17	\$180,064	\$29,605	\$14,113	\$8,704	\$54,668	\$117,828	62.2	\$71,749	\$58,260	\$44,501
Alton..... Nov.	171	1,937,340	372	2,034,359	180,093	180,093	581,295	581,295	1,283,881	62.2	1,283,881	632,881	484,621
Alton..... Nov.	956	1,080,546	152,324	1,434,830	162,644	162,644	481,018	481,018	953,731	66.4	953,731	396,369	260,245
Alton..... Nov.	956	11,020,540	1,850,666	14,807,860	2,473,193	2,473,193	5,561,398	5,561,398	11,456,702	77.4	3,351,158	2,414,516	809,392
Atchison, Topeka & Santa Fe System..... Nov.	13,227	12,262,976	1,181,463	14,566,368	1,927,630	2,982,337	429,712	4,850,939	10,615,971	72.9	3,950,397	2,627,865	3,639,736
Atlanta & West Point..... Nov.	13,200	11,625,021	14,246,854	142,079,629	22,308,856	32,539,999	4,619,718	49,593,816	113,765,714	80.1	28,313,985	15,577,885	26,402,609
Atlanta & West Point..... Nov.	93	11,123,361	23,758	163,804	33,119	33,119	8,543	62,108	130,354	79.6	33,450	20,493	11,219
Atlanta & West Point..... Nov.	93	1,132,361	252,640	1,636,956	199,337	336,542	90,797	658,737	1,396,079	85.3	240,877	151,956	86,306
Western of Alabama..... Nov.	133	105,987	23,913	148,521	13,742	36,344	7,257	53,244	120,163	80.9	28,358	11,202	23,527
Atlanta, Birmingham & Coast..... Nov.	133	1,013,792	255,957	1,443,201	202,460	362,683	77,847	568,270	1,305,575	90.5	137,626	25,203	37,220
Atlanta, Birmingham & Coast..... Nov.	639	254,417	8,482	292,637	57,335	50,824	23,403	107,599	263,183	89.9	29,454	1,795	16,286
Atlanta, Birmingham & Coast..... Nov.	639	2,596,290	179,268	3,112,386	492,680	551,828	245,999	1,164,366	2,722,663	87.5	389,723	202,059	44,394
Atlantic Coast Line..... Nov.	5,105	2,828,425	394,613	3,603,124	363,967	733,568	149,327	1,393,688	2,792,225	77.5	810,809	535,899	503,645
Atlantic Coast Line..... Nov.	5,127	28,552,665	6,146,305	39,338,003	4,263,870	7,666,828	1,423,243	15,405,267	30,557,952	77.7	8,780,011	4,705,011	3,906,873
Charleston & Western Carolina..... Nov.	342	193,756	1,394	195,221	25,748	28,690	6,580	63,755	130,789	65.7	68,432	46,432	42,129
Charleston & Western Carolina..... Nov.	342	1,977,079	14,297	2,044,628	284,823	312,896	73,304	661,797	1,388,979	67.9	655,649	438,649	411,359
Baltimore & Ohio..... Nov.	6,486	13,378,028	860,491	15,115,108	1,266,067	3,315,700	384,739	5,185,603	10,832,726	71.7	4,282,382	3,400,040	2,968,701
Baltimore & Ohio..... Nov.	6,486	135,149,857	10,159,607	154,305,864	14,255,274	34,047,639	4,289,251	52,126,270	112,822,561	73.1	41,483,303	32,201,822	27,571,953
Staten Island Rapid Transit..... Nov.	23	57,899	69,184	126,249	19,535	22,265	1,703	93,106	138,729	109.9	13,480	34,280	50,226
Staten Island Rapid Transit..... Nov.	23	57,899	849,194	1,464,600	156,577	233,485	20,072	932,722	1,478,721	100.9	12,815	47,765	410,792
Bangor & Aroostook..... Nov.	603	508,101	16,840	544,080	70,333	82,706	5,194	117,377	297,887	54.8	246,193	180,980	179,273
Bangor & Aroostook..... Nov.	603	4,986,640	198,465	5,399,129	988,041	942,817	58,679	1,392,713	3,642,430	67.5	1,756,699	1,199,609	1,198,549
Bessemer & Lake Erie..... Nov.	225	1,313,341	769	1,327,689	74,087	267,504	12,915	211,656	600,674	45.2	727,015	550,391	612,556
Bessemer & Lake Erie..... Nov.	225	14,281,853	30,844	14,460,008	1,250,430	3,035,893	130,432	2,174,745	6,995,692	48.4	7,464,316	5,993,609	6,452,948
Boston & Maine..... Nov.	1,976	2,898,186	553,291	3,966,455	412,882	614,802	67,489	1,527,682	2,797,958	70.5	1,168,497	893,774	694,315
Boston & Maine..... Nov.	1,991	30,922,388	6,319,816	42,045,464	6,460,476	6,820,411	732,833	16,949,061	33,012,128	78.5	9,033,366	5,973,476	3,870,990
Brooklyn Eastern District Terminal..... Nov.	1,241	124,636	.....	127,205	9,944	10,196	290	36,306	63,381	49.8	63,824	52,420	52,420
Brooklyn Eastern District Terminal..... Nov.	1,241	1,201,660	.....	1,227,755	76,858	111,402	5,276	340,384	604,128	49.2	623,627	525,249	526,216
Burlington-Rock Island..... Nov.	255	90,172	13,943	110,604	17,700	17,113	4,691	45,439	92,929	84.0	17,675	13,192	340
Burlington-Rock Island..... Nov.	255	679,623	78,631	817,291	194,277	140,436	44,949	427,208	888,831	108.8	293	146,674	252,281
Cambria & Indiana..... Nov.	37	117,222	.....	117,343	11,596	39,354	365	12,754	70,405	60.00	46,938	13,448	79,535
Cambria & Indiana..... Nov.	37	1,163,614	.....	1,165,380	96,025	588,259	4,189	137,955	890,821	76.44	274,559	22,956	734,933
Canadian Pacific Lines in Maine..... Nov.	233	120,085	12,334	143,888	19,010	21,392	9,458	61,373	118,052	82.0	25,836	17,739	3,056
Canadian Pacific Lines in Maine..... Nov.	233	1,621,440	161,707	1,921,594	419,051	413,715	767,701	1,787,289	3,976,366	93.1	134,305	35,993	166,436
Canadian Pacific Lines in Vermont..... Nov.	85	68,937	7,046	87,187	12,046	19,482	4,203	56,326	97,636	111.9	10,449	9,555	29,769
Canadian Pacific Lines in Vermont..... Nov.	85	713,858	95,412	935,144	207,579	270,634	47,059	621,982	1,209,449	129.3	274,305	337,112	543,526
Central of Georgia..... Nov.	1,926	1,151,127	106,869	1,399,651	155,595	269,855	54,101	532,849	1,132,457	80.9	266,994	163,565	148,338
Central of Georgia..... Nov.	1,926	11,658,273	1,276,200	14,917,759	1,780,267	3,027,158	583,500	5,778,395	12,108,129	81.6	2,883,680	1,284,343	1,043,721
Central of New Jersey..... Nov.	681	2,198,504	346,792	2,723,642	199,260	327,643	41,451	1,000,392	1,943,133	71.3	780,599	664,941	1,043,721
Central of New Jersey..... Nov.	681	22,798,555	4,247,559	28,869,045	2,633,844	5,466,954	525,031	12,010,353	21,508,123	74.4	7,380,922	2,890,359	1,385,840
Central Vermont..... Nov.	455	427,996	28,204	504,266	60,688	89,840	13,456	237,323	425,807	85.4	78,459	56,353	9,657
Central Vermont..... Nov.	454	4,508,229	359,910	5,324,226	955,477	1,108,687	158,554	2,618,450	5,096,547	94.7	227,679	8,210	265,213
Chesapeake & Ohio..... Nov.	3,106	11,884,899	231,671	12,590,729	942,793	1,744,208	217,280	2,557,511	5,783,952	45.9	6,806,775	5,499,910	5,557,610
Chesapeake & Ohio..... Nov.	3,106	116,887,626	3,064,631	124,398,635	11,272,037	21,184,831	2,131,020	26,310,212	64,432,408	51.8	59,966,227	47,764,717	48,100,531
Chicago & Eastern Illinois..... Nov.	931	1,196,825	102,790	1,479,608	145,020	219,729	56,054	501,099	985,026	66.6	494,582	394,582	245,162
Chicago & Eastern Illinois..... Nov.	931	11,516,207	1,214,736	14,454,341	1,647,297	2,449,234	612,403	5,365,762	10,763,425	74.5	3,690,916	2,830,916	2,534,552
Chicago & Illinois Midland..... Nov.	131	3,286,140	1,178	3,674,340	35,523	52,380	16,789	84,186	207,435	56.5	159,995	126,100	121,364
Chicago & Illinois Midland..... Nov.	131	3,286,140	14,004	3,388,182	304,264	577,329	184,677	822,833	2,680,087	61.4	1,308,095	1,063,111	1,063,378
Chicago & North Western..... Nov.	8,355	5,224,965	856,774	7,556,266	798,533	1,477,327	170,312	2,916,039	5,691,317	75.3	1,864,949	1,370,248	1,125,724
Chicago & North Western..... Nov.	8,355	65,809,712	9,760,768	84,264,538	14,841,130	18,452,237	1,904,690	32,506,146	70,772,486	84.0	13,492,052	6,917,158	2,935,191
Chicago, Burlington & Quincy..... Nov.	8,976	7,108,668	660,920	8,679,912	841,130	1,400,893	252,912	3,002,912	5,837,966	67.3	5,837,966	2,045,161	1,585,538
Chicago, Burlington & Quincy..... Nov.	9,006	72,617,657	7,419,185	89,161,423	12,007,979	15,201,907	2,561,610	31,419,618	65,068,042	73.0	24,093,381	16,382,826	11,870,352
Chicago Great Western..... Nov.	1,512	1,549,414	41,340	1,700,392	176,769	210,244	54,267	594,393	1,080,481	63.5	619,911	534,043	255,175
Chicago Great Western..... Nov.	1,512	15,374,038	513,254	17,029,231	2,079,981	2,275,216	589,960	6,258,270	12,095,001	71.0	4,234,230	4,075,800	1,832,861
Chicago, Indianapolis & Louisville..... Nov.	572	7,853,274	541,840	9,418,649	78,586	222,994	28,607	352,462	746,676	75.9	227,600	177,381	182,787
Chicago, Indianapolis & Louisville..... Nov.	572	7,853,274	541,840	9,418,649	885,049	2,242,019	311,240	3,644,077	7,466,716	75.3	1,951,933	1,488,743	364,881

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ONE of the three Mikado Type Locomotives recently delivered by Lima Locomotive Works, Incorporated, to The Detroit & Toledo Shore Line Railroad Company.

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO



REVENUES AND EXPENSES OF RAILWAYS

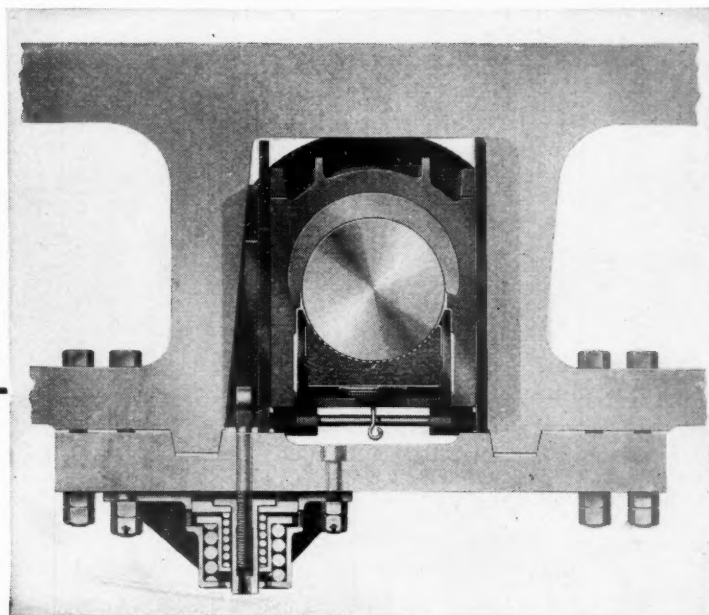
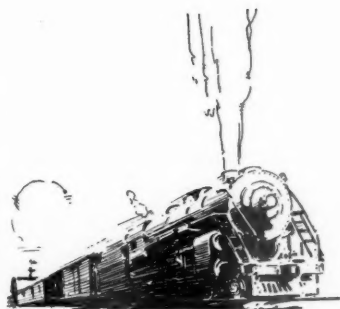
MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income		
		Freight	Passenger (inc. misc.)	Total	Maintenance of way and structures	Equipment	Traffic	Trans- portation	Total			Operating income	After depre. & retir. 1936	Before depre. & ret. 1935
Chicago, Milw., St. Paul & Pacific.....Nov.	11,115	\$7,771,838	\$560,696	\$8,332,534	\$1,484,043	\$1,635,195	\$218,768	\$3,382,301	\$6,796,327	74.0	\$2,387,716	\$1,709,716	\$1,176,072	\$1,404,962
Chicago, Rock Island & Pacific.....Nov.	11,126	83,743,234	6,755,423	90,498,657	17,486,228	17,905,516	2,347,661	36,984,831	78,349,421	78.6	21,274,979	13,760,979	7,979,254	3,781,137
Chicago, Rock Island & Pacific.....Nov.	7,533	4,895,584	553,143	5,448,727	901,224	1,110,219	205,068	2,493,618	4,745,259	81.3	1,138,482	755,530	502,918	848,907
Chicago, Rock Island & Pacific.....Nov.	7,567	54,204,992	6,298,929	60,503,921	10,673,741	15,356,167	2,204,199	27,896,699	59,163,398	88.1	8,007,616	3,033,733	136,431	3,771,233
Chicago, Rock Island & Gulf.....Nov.	626	268,543	35,281	303,824	89,847	44,967	16,702	126,106	303,928	77.1	90,283	67,827	18,046	52,339
Chicago, St. Paul, Minneap. & Omaha.....Nov.	626	2,807,290	317,291	3,124,581	616,104	247,504	179,164	1,394,778	2,903,168	72.0	1,094,508	848,960	271,264	315,189
Chicago, St. Paul, Minneap. & Omaha.....Nov.	1,648	1,263,460	114,602	1,378,062	247,000	247,418	35,715	703,071	1,281,578	86.5	199,871	103,729	14,905	34,199
Chicago, St. Paul, Minneap. & Omaha.....Nov.	1,648	14,159,907	1,481,425	15,641,332	2,059,168	2,856,233	388,400	7,772,583	13,935,886	82.9	2,882,341	1,765,325	466,562	1,011,799
Clinchfield Railroad.....Nov.	309	591,773	4,109	600,816	37,626	117,460	18,891	110,409	298,377	49.7	302,439	235,733	278,770	231,150
Colorado & Southern.....Nov.	309	5,558,646	48,948	5,607,594	422,523	1,311,160	194,440	1,098,856	3,186,265	56.2	2,481,122	1,926,355	2,366,611	1,778,422
Colorado & Southern.....Nov.	956	613,127	40,363	653,490	57,600	122,297	15,644	261,226	491,782	69.1	220,108	155,047	133,115	234,730
Colorado & Southern.....Nov.	991	5,734,134	390,541	6,124,675	803,443	1,247,735	155,425	2,651,647	5,241,703	77.9	1,483,347	778,800	507,657	247,693
Fort Worth & Denver City.....Nov.	902	565,694	68,000	633,694	52,106	84,641	17,136	171,156	360,646	56.5	277,348	245,150	211,610	349,738
Fort Worth & Denver City.....Nov.	902	4,927,849	551,111	5,478,960	492,774	1,010,028	204,880	1,723,471	3,722,529	67.7	1,772,217	1,394,229	1,038,693	846,234
Columbus & Greenville.....Nov.	167	113,945	11,368	125,313	20,341	17,146	4,306	408,260	94,452	71.0	38,653	32,100	27,323	30,106
Columbus & Greenville.....Nov.	167	967,766	79,970	1,047,736	201,100	171,390	43,406	408,260	935,048	83.9	179,119	133,547	107,744	47,605
Delaware & Hudson.....Nov.	831	2,111,646	79,697	2,191,343	236,694	519,237	44,662	772,385	1,707,268	75.1	555,487	421,133	417,896	42,037
Delaware & Hudson.....Nov.	831	20,990,087	1,081,412	22,071,500	3,033,638	5,502,744	500,688	8,389,852	18,889,546	82.0	4,157,155	2,627,230	2,685,347	1,283,879
Delaware, Lackawanna & Western.....Nov.	984	3,195,206	378,244	3,573,450	199,064	749,737	111,335	1,858,153	3,098,332	72.8	1,159,907	824,490	824,490	430,363
Delaware, Lackawanna & Western.....Nov.	987	33,708,411	6,355,845	40,064,256	4,021,282	8,478,729	1,260,733	20,150,919	35,880,801	79.3	9,385,415	5,702,415	5,550,792	2,994,552
Denver & Rio Grande Western.....Nov.	2,576	2,213,677	68,188	2,281,865	275,569	500,681	57,203	835,438	1,766,836	74.3	612,452	431,547	368,505	569,595
Denver & Rio Grande Western.....Nov.	2,582	20,886,130	1,378,877	22,265,007	3,781,054	5,951,001	584,900	8,000,550	19,084,864	81.7	4,278,902	2,225,925	1,437,158	2,029,516
Denver & Salt Lake.....Nov.	232	271,192	287,357	558,549	31,351	46,751	2,404	69,406	156,251	54.4	131,106	105,236	132,418	142,253
Denver & Salt Lake.....Nov.	232	2,369,495	82,390	2,451,885	424,414	665,369	25,481	653,855	1,801,679	70.6	751,649	516,011	915,455	1,133,739
Detroit & Mackinac.....Nov.	242	83,474	2,624	86,098	7,695	9,201	857	26,113	47,271	51.3	44,905	42,375	35,713	19,331
Detroit & Mackinac.....Nov.	242	631,013	33,499	664,512	71,285	129,369	10,907	260,345	554,983	75.6	178,250	160,227	118,254	70,138
Detroit & Toledo Shore Line.....Nov.	50	369,380	.....	369,380	19,078	22,925	8,005	80,559	138,410	37.3	233,013	194,899	133,414	106,980
Detroit & Toledo Shore Line.....Nov.	50	3,500,625	.....	3,500,625	293,814	278,649	86,146	834,455	1,375,507	44.8	1,942,646	1,599,252	992,193	900,278
Detroit, Toledo & Ironton.....Nov.	472	600,357	198	601,555	65,226	80,035	1,244	126,293	307,977	49.6	312,643	262,372	223,417	282,377
Detroit, Toledo & Ironton.....Nov.	472	6,775,501	2,642	6,778,143	702,496	914,197	117,903	1,483,420	3,494,025	50.1	2,481,529	2,829,661	2,419,426	2,921,905
Duluth, Missabe & Northern.....Nov.	556	1,223,728	2,367	1,226,095	124,180	227,638	3,889	407,454	805,721	57.0	608,999	327,062	327,062	367,278
Duluth, Missabe & Northern.....Nov.	558	16,451,840	27,771	16,479,611	1,641,177	2,355,115	42,024	3,187,866	7,213,866	40.8	11,213,072	9,337,723	9,320,617	4,423,566
Duluth, Winnipeg & Pacific.....Nov.	178	108,451	1,563	110,014	14,607	16,987	1,724	46,183	83,918	73.4	30,348	22,199	9,631	6,696
Duluth, Winnipeg & Pacific.....Nov.	178	1,184,023	22,051	1,206,074	251,206	393,343	19,657	495,918	1,009,576	81.3	232,506	146,977	14,308	136,613
Elgin, Joliet & Eastern.....Nov.	434	1,593,934	187	1,594,121	139,587	302,671	14,108	615,680	1,117,605	60.9	718,415	616,204	531,503	351,601
Elgin, Joliet & Eastern.....Nov.	434	14,639,630	385	14,640,015	1,553,583	3,572,379	153,867	6,050,821	11,832,044	69.1	5,290,554	4,067,389	3,613,674	2,577,346
Erie.....Nov.	2,297	6,501,886	406,777	6,908,663	496,072	1,357,438	174,278	2,618,302	4,943,770	66.3	2,514,268	1,991,923	1,554,535	1,225,594
Erie.....Nov.	2,297	66,613,332	4,843,943	71,457,275	6,447,647	14,326,194	1,873,032	27,742,676	53,711,609	69.5	23,598,953	18,360,653	15,067,669	11,838,039
New Jersey & New York.....Nov.	45	16,467	44,853	61,320	4,520	12,159	495	53,288	72,186	113.4	8,552	13,678	28,102	31,815
New Jersey & New York.....Nov.	45	177,241	517,797	695,038	53,679	163,410	6,793	536,213	781,826	109.0	64,441	118,875	291,784	385,976
New York, Susquehanna & Western.....Nov.	215	248,963	22,348	271,311	23,789	30,851	5,087	117,754	190,242	67.4	91,898	67,185	45,729	26,695
New York, Susquehanna & Western.....Nov.	215	2,732,432	3,129,135	5,861,567	282,728	381,542	52,887	1,354,147	2,219,295	70.9	909,840	644,680	309,230	409,806
Florida East Coast.....Nov.	684	506,393	115,708	622,101	688,623	141,038	21,730	224,460	542,631	78.8	1,45,992	1,007,699	76,995	14,689
Florida East Coast.....Nov.	707	4,810,971	2,036,616	6,847,587	1,094,454	1,469,640	243,674	2,496,635	5,884,897	76.7	1,792,324	1,008,392	594,192	262,468
Fort Smith & Western.....Nov.	249	77,874	787	78,661	14,183	8,340	5,983	23,341	55,783	68.3	25,884	24,884	15,119	9,746
Fort Smith & Western.....Nov.	249	689,914	11,035	700,949	73,737	94,274	62,609	231,466	595,972	80.9	140,765	125,984	42,165	48,662
Georgia Railroad.....Nov.	329	308,216	13,365	321,581	29,191	49,740	17,623	141,717	251,540	72.7	94,343	66,384	73,059	84,407
Georgia Railroad.....Nov.	329	2,981,470	157,274	3,138,744	321,560	650,578	193,021	1,435,640	2,750,693	80.8	654,229	542,163	633,127	514,185
Georgia & Florida.....Nov.	408	92,692	2,887	95,579	22,695	18,262	8,045	37,783	92,538	82.5	7,544	444	2,788	2,258
Georgia & Florida.....Nov.	408	1,015,247	29,978	1,045,225	259,598	190,987	92,033	399,543	1,004,940	92.3	84,326	9,298	11,902	24,969
Grand Trunk Western.....Nov.	1,032	1,855,462	79,738	1,935,200	198,775	349,769	79,738	797,302	1,456,972	69.6	637,724	533,462	264,519	338,938
Grand Trunk Western.....Nov.	1,032	19,138,731	841,468	20,000,199	2,721,533	4,011,570	385,632	8,457,172	16,511,172	76.6	5,030,559	3,851,911	2,334,336	2,173,246
Canadian Nat'l Lines in New Eng.....Nov.	172	101,867	4,192	106,059	18,580	18,580	2,310	58,008	110,671	94.9	5,905	9,568	35,604	75,627
Canadian Nat'l Lines in New Eng.....Nov.	172	1,080,524	68,146	1,148,670	207,252	212,454	26,602	653,149	1,398,920	111.9	148,422	312,924	604,245	675,113
Great Northern.....Nov.	8,093	6,534,049	763,671	7,297,720	1,020,175	1,020,175	175,303	2,532,902	4,760,622	63.9	2,686,781	1,850,462	1,850,462	2,152,006
Great Northern.....Nov.	8,196	71,912,426	4,487,611	76,399,037	8,151,881	12,583,580	1,966,716	26,583,375	52,349,120	62.9	30,860,881	23,599,453	22,298,056	21,961,341

Continued on next left-hand page

MAINTAINING DRIVING BOX ADJUSTMENT

. . . is a complicated problem



Holding driving boxes so they do not pound and do not stick, is impossible under the old methods.

Regardless of box expansion due to temperature change freedom of vertical movement must be maintained.

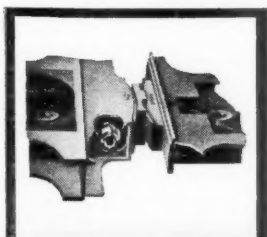
Ample cushioned resistance to horizontal movement between the pedestal jaws must be provided to hold the box against pounding yet shield and cushion unusual shocks that otherwise might overstress parts and cause failure.

The Franklin Automatic Compensator and Snubber holds the box in adjustment at all times, by compensating for expansion and providing a yielding cushioned resistance to excessive blows.

It reduces maintenance, protects the track structure and vastly improves the riding quality of the locomotive. To the locomotive it is what the shock absorber is to your automobile.

Its twin, the Type E-2 Radial Buffer, prevents all slack between engine and tender and dampens oscillation between these units which further improves the riding qualities of the locomotive.

Because material and tolerances are just right for the job, genuine Franklin repair parts give maximum service life.



Franklin Type E-2 Radial Buffer dampens oscillation between engine and tender and makes for easier riding.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from operation	Net railway operating income		
		Freight	Passenger	Total	Way and structures	Equipment	Maintenance of			Operating income	After depr. & retir. 1936	Before depr. & ret. 1936
Green Bay & Western.....	Nov. 234	\$132,635	\$456	\$133,091	\$43,383	\$13,045	\$44,389	81.1	\$25,972	\$11,738	\$8,176	\$12,347
Green Bay & Western.....	11 mos. 234	1,402,702	8,523	1,411,225	347,684	176,447	496,676	76.9	1,132,178	1,132,178	146,631	123,231
Gulf & Ship Island.....	Nov. 259	1,402,702	8,523	1,411,225	347,684	176,447	496,676	100.5	1,132,178	1,132,178	146,631	123,231
Gulf & Ship Island.....	11 mos. 259	1,092,715	98,710	1,191,425	206,430	206,323	650,873	87.6	1,163,316	1,163,316	107,929	17,759
Gulf, Mobile & Northern.....	Nov. 936	591,598	26,542	618,140	53,306	83,835	167,407	59.36	260,799	193,799	125,083	132,709
Gulf, Mobile & Northern.....	11 mos. 936	6,137,332	287,246	6,424,578	668,460	348,438	1,742,600	61.20	2,592,912	2,009,133	1,116,342	1,019,653
Illinois Central.....	Nov. 4,966	7,517,125	750,156	8,267,281	8,909,389	620,607	1,889,934	70.8	2,599,584	1,967,087	1,832,690	834,806
Illinois Central.....	11 mos. 4,974	74,494,250	8,235,387	82,729,637	8,193,201	20,041,374	2,484,741	76.4	21,144,347	14,332,796	12,066,838	9,635,382
Yazoo & Mississippi Valley.....	Nov. 1,619	1,606,716	106,003	1,712,719	74,123	231,823	32,305	51.1	889,513	750,832	657,015	279,214
Yazoo & Mississippi Valley.....	11 mos. 1,619	12,718,574	873,630	13,592,204	1,092,642	2,278,063	361,834	66.3	4,884,448	3,406,958	2,385,857	863,332
Illinois Central System.....	Nov. 6,593	87,212,824	856,159	88,068,983	694,730	2,121,737	2,555,892	67.5	3,489,098	2,715,489	2,500,505	1,107,020
Illinois Central System.....	11 mos. 6,593	87,212,824	856,159	88,068,983	694,730	2,121,737	2,555,892	75.0	26,028,795	17,725,694	14,554,292	10,555,789
Illinois Terminal.....	Nov. 504	401,419	70,067	471,486	48,206	64,812	14,860	60.31	202,113	159,660	138,569	138,029
Illinois Terminal.....	11 mos. 504	4,233,022	752,343	4,985,365	576,585	738,637	174,334	63.16	2,005,374	1,587,327	1,374,246	1,088,035
Kansas City Southern.....	Nov. 878	1,123,477	205,451	1,328,928	1,103,455	2,034,469	531,517	62.8	4,695,981	3,641,481	2,880,232	1,287,465
Kansas City Southern.....	11 mos. 878	11,234,477	2,054,451	13,288,928	1,103,455	2,034,469	531,517	62.8	4,695,981	3,641,481	2,880,232	1,287,465
Kansas, Oklahoma & Gulf.....	Nov. 326	208,704	520	209,224	40,851	15,374	8,354	40.9	135,323	99,288	80,791	73,172
Kansas, Oklahoma & Gulf.....	11 mos. 326	2,229,797	5,956	2,235,753	265,319	238,333	87,275	47.3	1,153,857	931,080	735,147	478,892
Lake Superior & Ishpeming.....	Nov. 160	2,507,319	1,128	2,508,447	314,608	283,440	430,870	49.0	1,753,837	1,304,065	1,291,085	876,432
Lake Superior & Ishpeming.....	11 mos. 160	2,507,319	1,128	2,508,447	314,608	283,440	430,870	49.0	1,753,837	1,304,065	1,291,085	876,432
Lehigh & Hudson River.....	Nov. 96	132,499	113	132,612	14,231	17,398	3,774	66.2	44,994	31,280	18,537	11,342
Lehigh & Hudson River.....	11 mos. 96	1,421,702	1,240	1,422,942	154,040	198,497	40,431	69.1	442,700	298,694	164,594	184,440
Lehigh & New England.....	Nov. 218	341,236	232	341,468	33,547	80,671	5,918	72.9	33,129	72,921	71,816	30,616
Lehigh & New England.....	11 mos. 218	3,605,034	2,931	3,607,965	382,561	791,411	67,495	73.8	954,521	730,070	722,592	769,507
Lehigh Valley.....	Nov. 1,324	3,789,589	217,379	4,006,968	226,328	775,632	113,934	70.6	1,256,909	1,066,384	844,583	349,403
Lehigh Valley.....	11 mos. 1,333	39,111,891	2,404,711	41,516,602	2,872,954	7,702,696	1,241,900	72.5	12,231,657	9,985,804	8,023,590	4,232,136
Louisiana & Arkansas.....	Nov. 606	409,746	3,493	413,239	48,225	72,723	32,057	70.5	1,650,627	1,253,689	1,002,265	319,977
Louisiana & Arkansas.....	11 mos. 606	4,784,916	96,830	4,881,746	665,422	729,956	316,730	67.5	1,650,627	1,253,689	1,002,265	319,977
Louisiana, Arkansas & Texas.....	Nov. 255	91,640	207	91,847	28,438	9,440	4,797	119.3	18,570	24,352	40,831	3,607
Louisiana, Arkansas & Texas.....	11 mos. 255	1,095,307	2,872	1,098,179	304,665	108,059	51,543	85.1	171,657	119,909	59,663	42,494
Louisville & Nashville.....	Nov. 4,944	7,412,350	516,563	7,928,913	8,401,344	1,797,717	1,718,800	67.7	2,710,916	1,881,877	1,937,512	1,286,185
Louisville & Nashville.....	11 mos. 4,990	70,749,897	5,915,852	76,665,749	8,228,739	18,652,133	1,976,905	72.1	22,903,629	17,039,976	17,530,432	12,319,925
Maine Central.....	Nov. 1,046	839,610	68,351	907,961	131,052	159,684	35,185	69.8	301,932	235,169	168,348	208,395
Maine Central.....	11 mos. 1,046	9,106,185	900,972	10,007,157	1,949,857	1,874,134	413,209	72.2	2,519,308	1,796,495	1,722,360	1,634,435
Midland Valley.....	Nov. 351	133,018	34	133,052	18,603	14,091	31,307	52.2	64,640	54,486	41,834	43,975
Midland Valley.....	11 mos. 354	1,380,054	151	1,380,205	184,106	140,091	25,766	53.0	658,424	560,718	463,705	374,210
Minneapolis & St. Louis.....	Nov. 1,530	654,640	10,432	665,072	108,726	106,092	282,923	81.8	128,578	83,183	24,994	40,878
Minneapolis & St. Louis.....	11 mos. 1,573	7,711,474	135,469	7,846,943	1,103,924	1,321,288	3,298,052	79.3	1,711,008	1,337,378	682,873	61,760
Minneapolis, St. Paul & S. S. Marie.....	Nov. 4,296	1,885,022	75,205	1,960,227	262,244	385,072	58,189	79.7	416,054	269,032	194,396	208,497
Minneapolis, St. Paul & S. S. Marie.....	11 mos. 4,296	18,467,609	1,148,402	19,616,011	3,332,491	4,091,986	653,305	77.7	5,481,604	3,698,589	2,050,594	1,514,746
Duluth, South Shore & Atlantic.....	Nov. 550	194,801	12,355	207,156	29,150	39,376	4,344	71.9	63,105	50,734	35,793	9,649
Duluth, South Shore & Atlantic.....	11 mos. 550	2,336,931	137,918	2,474,849	370,590	431,099	947,257	68.2	862,788	732,653	623,630	386,942
Spokane International.....	Nov. 163	58,134	1,207	59,341	12,171	6,260	22,288	72.8	17,765	16,647	12,709	1,082
Spokane International.....	11 mos. 163	640,083	15,425	655,508	159,168	74,662	235,622	74.8	181,509	143,460	98,345	13,557
Mississippi Central.....	Nov. 150	74,210	2,078	76,288	16,300	10,437	6,765	76.3	18,609	14,693	10,613	13,521
Mississippi Central.....	11 mos. 150	797,912	16,747	814,659	75,342	122,238	21,656	74.2	216,709	175,929	136,391	24,519
Missouri & Arkansas.....	Nov. 364	93,519	1,213	94,732	23,369	12,282	31,895	78.3	179,193	150,400	5,807	16,072
Missouri & Arkansas.....	11 mos. 364	872,236	14,551	886,787	950,079	114,560	317,158	81.1	179,193	140,487	45,887	52,049
Missouri-Illinois.....	Nov. 205	122,253	614	122,867	22,084	12,753	3,203	64.3	44,539	40,268	27,880	11,746
Missouri-Illinois.....	11 mos. 205	1,026,955	7,680	1,034,635	225,717	137,415	28,030	75.2	261,395	200,960	79,586	49,080
Missouri-Kansas-Texas Lines.....	Nov. 3,293	2,236,429	237,286	2,473,715	266,462	191,490	110,467	63.7	950,284	900,732	660,850	514,563
Missouri-Kansas-Texas Lines.....	11 mos. 3,293	23,828,522	2,218,391	26,046,913	3,499,816	4,852,158	1,278,797	73.4	7,626,352	5,934,586	3,606,595	1,355,371
Missouri Pacific.....	Nov. 7,218	6,959,171	442,852	7,402,023	8,004,049	1,103,239	2,742,863	74.2	2,061,331	1,676,890	1,160,607	508,963
Missouri Pacific.....	11 mos. 7,224	70,996,502	4,678,464	75,674,966	8,230,270	11,222,106	28,955,489	75.6	20,117,354	15,431,404	9,898,765	4,685,906
Gulf Coast Line.....	Nov. 1,763	10,069,561	407,925	10,477,486	1,769,524	2,072,113	495,263	75.94	2,665,614	1,934,822	1,307,267	140,755
Gulf Coast Line.....	11 mos. 1,763	10,069,561	407,925	10,477,486	1,769,524	2,072,113	495,263	75.94	2,665,614	1,934,822	1,307,267	140,755

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3 essential Factors

FOR FULL FUEL ECONOMY

SECURITY Brick Arches are designed for the individual class of locomotive in which they are to serve, by practical railroad men who have spent their lifetime in this work.

THE Security Brick quality is the result of many years of brick making for locomotive service. Security brick assures maximum service life.

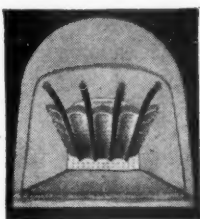
AMERICAN Arch Company service engineers are constantly available to aid in proper Brick Arch installation and maintenance.

Security Brick Arches embody every element of successful, satisfactory service and maximum economy.

There's More to
SECURITY ARCHES
Than Just Brick

**HARBISON-WALKER
REFRACTORIES CO.**

Refractory Specialists



**AMERICAN ARCH CO.
INCORPORATED**

*Locomotive Combustion
Specialists* * * *

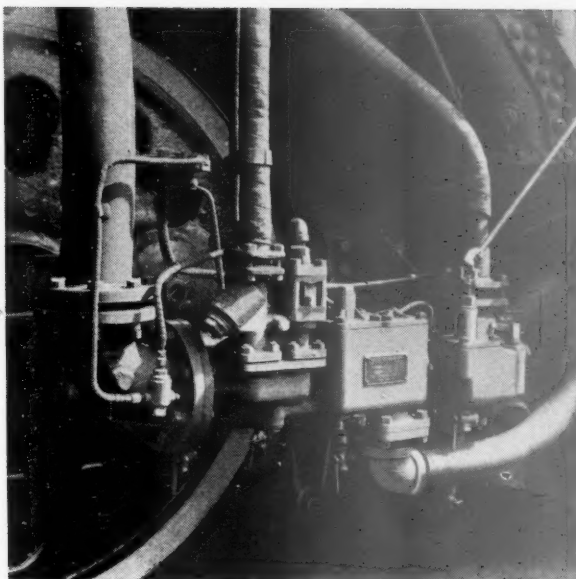
REVENUES AND EXPENSES OF RAILWAYS

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1936—Continued

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger (inc. misc.)	Total	Way and structures	Traffic	Transportation			Operating income	After deprec. & retir. 1936
International Great Northern..... Nov.	1,154	\$81,576	\$85,257	\$1,048,393	\$151,789	\$30,348	\$431,012	\$879,306	\$117,250	\$13,366	\$15,778
11 mos.	1,154	9,123,301	11,085,759	16,093,633	2,213,431	338,037	4,564,181	9,312,456	1,203,934	140,227	152,136
Mobile & Ohio..... Nov.	1,201	9,136,106	1,037,838	1,583,316	133,893	48,082	348,602	725,875	257,983	196,399	24,100
11 mos.	1,201	8,987,437	9,835,161	1,210,425	2,009,944	458,177	3,492,892	7,620,978	1,673,870	1,097,775	58,447
Monongahela..... Nov.	171	419,676	726	423,876	39,460	413	86,039	157,189	228,029	146,272	86,455
11 mos.	172	4,228,779	9,645	4,263,311	420,883	4,758	877,799	1,653,024	2,199,623	1,307,130	1,013,436
Montour..... Nov.	57	206,793	208,109	12,487	43,014	1,037	60,944	121,936	62,190	80,193	60,535
11 mos.	57	2,140,418	119	2,154,409	156,307	10,500	497,382	1,212,341	710,937	896,452	815,073
Nashville, Chattanooga & St. Louis..... Nov.	1,130	1,049,168	82,258	1,249,123	155,115	59,216	465,903	1,031,987	175,070	163,128	108,618
11 mos.	1,152	10,545,986	991,911	12,857,801	1,660,233	664,698	4,942,810	11,031,424	1,330,316	1,219,700	484,462
Nevada Northern..... Nov.	165	45,103	1,814	52,311	9,908	884	10,469	30,439	13,097	15,274	23,781
11 mos.	165	438,342	13,557	504,824	96,352	9,649	102,261	293,240	122,510	152,823	80,290
New York Central..... Nov.	11,218	23,256,336	5,009,095	31,883,252	2,937,124	6,789,648	11,438,819	23,198,683	6,287,725	5,027,105	4,393,696
11 mos.	11,215	233,163,524	56,364,335	326,456,683	33,487,288	69,655,400	118,776,386	244,031,641	58,368,941	43,498,688	32,500,592
Pittsburgh & Lake Erie..... Nov.	233	2,030,863	57,669	2,150,601	194,536	28,844	602,731	1,640,105	342,010	516,185	321,330
11 mos.	233	18,982,428	654,443	20,151,250	1,885,710	291,786	6,082,124	15,451,507	3,048,560	4,911,044	3,523,571
New York, Chicago & St. Louis..... Nov.	1,704	3,325,947	60,206	3,502,829	300,868	114,154	1,176,017	2,316,852	999,678	749,688	620,611
11 mos.	1,704	33,582,691	884,611	37,751,252	3,820,075	1,268,323	12,321,691	24,421,452	11,208,770	8,161,921	6,082,402
New York, New Haven & Hartford..... Nov.	2,038	3,974,840	2,239,674	7,028,786	702,826	99,347	4,718,181	4,718,181	1,845,605	1,275,728	614,084
11 mos.	2,046	40,715,326	22,615,281	71,446,895	8,938,595	1,084,634	26,737,446	53,278,461	13,048,434	6,839,531	7,587,847
New York Connecting..... Nov.	20	237,407	.....	252,359	11,066	.....	33,227	53,295	163,914	142,117	118,573
11 mos.	20	2,438,764	.....	2,574,232	130,315	.....	352,778	581,655	1,608,607	1,289,014	1,154,800
New York, Ontario & Western..... Nov.	566	574,543	4,819	621,382	68,638	11,753	265,464	495,245	90,572	24,230	105,295
11 mos.	566	7,021,255	459,931	8,042,699	877,874	129,585	3,325,634	6,114,700	1,438,179	986,637	1,062,332
Norfolk & Western..... Nov.	2,204	8,835,566	172,422	9,992,155	999,209	133,691	1,749,537	4,578,279	3,551,478	3,951,898	3,162,673
11 mos.	2,172	81,532,918	1,988,595	85,995,254	10,383,632	1,376,274	18,230,900	45,774,454	28,143,175	31,294,815	24,552,959
Norfolk Southern..... Nov.	834	3,183,816	7,121	3,637,995	64,138	22,177	1,179,997	296,460	37,114	20,297	3,903
11 mos.	834	3,798,911	87,307	4,061,374	758,532	246,365	1,528,759	3,310,632	422,539	238,981	314,920
Northern Pacific..... Nov.	6,727	47,199,815	273,078	5,459,256	405,467	1,044,116	1,960,629	3,902,498	1,266,104	1,619,174	1,249,733
11 mos.	6,727	479,960	3,784,988	56,510,583	6,421,056	1,756,856	20,843,875	44,643,952	6,090,655	9,408,628	6,386,778
Northwestern Pacific..... Nov.	351	215,266	72,836	317,156	47,180	3,711	167,210	288,472	19,432	10,665	6,191
11 mos.	351	2,317,235	826,905	3,469,801	588,319	45,433	1,722,324	3,000,889	358,619	276,199	9,023
Oklahoma City-Ada-Atoka..... Nov.	132	36,589	389	39,468	18,513	852	11,937	33,886	360	7,157	4,054
11 mos.	132	462,301	4,428	492,008	104,882	8,323	123,652	282,323	171,168	104,322	41,987
Pennsylvania..... Nov.	10,371	29,361,317	5,439,909	38,443,966	3,824,537	669,641	13,187,187	27,789,055	7,836,491	7,385,187	6,544,045
11 mos.	10,403	303,021,074	61,196,167	401,023,478	36,521,202	7,029,956	13,758,620	285,120,095	83,558,989	75,759,856	64,188,076
Long Island..... Nov.	396	570,585	1,385,733	2,062,544	237,843	21,038	964,339	1,736,823	118,925	54,811	61,835
11 mos.	396	6,031,185	16,355,850	23,467,542	1,991,783	229,494	10,644,355	17,863,876	2,630,531	813,752	462,649
Pennsylvania-Reading Seashore Lines..... Nov.	412	264,300	125,632	407,848	56,151	10,197	261,797	415,942	77,451	149,809	145,585
11 mos.	412	2,945,825	2,874,731	6,077,906	645,286	128,365	3,218,605	5,114,690	50,857	1,137,881	1,549,132
Pere Marquette..... Nov.	2,115	2,692,016	56,505	2,891,655	305,427	65,528	974,307	1,993,182	898,473	632,301	577,132
11 mos.	2,115	26,822,679	850,710	29,266,252	3,256,333	712,105	10,310,206	21,337,945	7,777,711	4,928,727	4,181,983
Pittsburgh & Shawmut..... Nov.	100	63,569	296	64,895	16,132	1,180	185,168	58,168	6,727	6,689	3,537
11 mos.	103	491,148	3,381	502,864	124,243	13,362	1,650,036	151,260	27,976	4,488	31,681
Pittsburgh & West Virginia..... Nov.	138	312,827	.....	329,957	43,300	17,285	64,931	246,292	59,149	98,658	89,545
11 mos.	138	3,320,424	.....	3,509,073	463,469	184,473	684,601	2,442,320	794,069	1,159,130	923,250
Pittsburgh, Shawmut & Northern..... Nov.	190	101,566	23	103,846	18,501	1,336	34,562	81,337	20,466	33,764	16,220
11 mos.	190	958,649	417	976,020	195,578	15,086	349,660	828,899	122,066	49,981	9,322
Reading..... Nov.	1,456	4,546,144	305,067	5,066,557	395,678	72,633	1,838,396	3,422,496	1,175,660	1,210,692	1,179,936
11 mos.	1,456	47,827,480	3,550,045	53,677,914	3,937,695	819,080	20,138,308	36,605,869	12,318,017	12,774,872	11,133,346
Richmond, Fredericksburg & Potomac..... Nov.	117	383,676	158,126	655,063	59,886	8,131	220,614	459,242	142,778	105,088	14,467
11 mos.	117	3,532,609	1,945,267	6,794,692	646,603	98,999	2,616,818	5,218,476	1,105,445	695,019	284,806
Rutland..... Nov.	407	192,458	25,962	292,406	37,507	9,778	134,649	256,780	22,195	21,782	10,998
11 mos.	407	2,134,479	350,667	2,517,616	317,476	116,379	1,522,786	2,898,953	114,564	111,594	238,301
St. Louis-San Francisco..... Nov.	4,928	3,575,292	291,322	4,231,442	954,035	106,691	1,508,369	3,333,969	625,674	727,882	225,303
11 mos.	4,928	36,947,794	3,079,663	43,770,590	6,367,128	1,239,592	15,655,016	35,463,978	5,029,198	5,258,592	1,723,779
St. Louis-San Francisco..... Nov.	4,928	36,947,794	3,079,663	43,770,590	6,367,128	1,239,592	15,655,016	35,463,978	5,029,198	5,258,592	1,723,779
11 mos.	4,928	36,947,794	3,079,663	43,770,590	6,367,128	1,239,592	15,655,016	35,463,978	5,029,198	5,258,592	1,723,779

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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF NOVEMBER AND ELEVEN MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income			
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equipment	Traffic			Trans- portation	Total	Operating income	(After depr.& retir.— 1936	Before depr.& ret. — 1935
Fort Worth & Rio Grande.....Nov. 11 mos.	233	\$24,913	\$699	\$32,896	\$16,271	\$8,218	\$1,808	\$23,235	\$1,755	\$31,755	\$18,859	\$26,765	\$28,402
St. Louis, San Francisco & Texas.....Nov. 11 mos.	261	113,167	4,411	117,578	150,830	7,151	23,179	249,828	129.8	40,409	170,594	241,132	240,574
St. Louis, San Francisco & Texas.....Nov. 11 mos.	261	118,368	8,806	1,235,626	422,654	155,755	61,551	523,114	1,237,334	1,237,334	1,237,334	1,237,334	1,237,334
St. Louis Southwestern Lines.....Nov. 11 mos.	1,749	1,638,071	34,911	1,744,720	253,628	290,837	74,225	521,479	1,219,634	1,219,634	1,219,634	1,219,634	1,219,634
Seaboard Air Line.....Nov. 11 mos.	1,768	16,546,157	278,933	17,501,605	2,211,690	2,788,446	832,262	5,247,289	11,872,751	11,872,751	11,872,751	11,872,751	11,872,751
Southern Railway.....Nov. 11 mos.	6,441	7,063,277	747,482	8,569,565	954,023	1,585,709	1,623,006	30,200,138	5,803,017	5,803,017	5,803,017	5,803,017	5,803,017
Alabama Great Southern.....Nov. 11 mos.	315	496,421	49,238	587,729	61,016	131,484	12,122	171,250	395,778	395,778	395,778	395,778	395,778
Cinn., New Orleans & Texas Pacific.....Nov. 11 mos.	336	1,263,123	80,282	1,431,314	167,313	277,886	26,816	333,459	857,142	857,142	857,142	857,142	857,142
Georgia Southern & Florida.....Nov. 11 mos.	397	143,811	31,886	198,042	34,135	51,156	1,629	71,029	164,260	164,260	164,260	164,260	164,260
New Orleans & Northeastern.....Nov. 11 mos.	204	217,802	19,587	254,643	28,875	36,635	5,336	72,556	154,205	154,205	154,205	154,205	154,205
Northern Alabama.....Nov. 11 mos.	100	64,074	2,527,253	322,504	387,968	1,171	952	18,853	37,141	37,141	37,141	37,141	37,141
Southern Pacific Company.....Nov. 11 mos.	8,772	11,790,561	1,564,292	14,244,878	1,260,886	2,160,802	323,139	5,445,265	10,194,976	10,194,976	10,194,976	10,194,976	10,194,976
Southern Pacific Steamship Lines.....Nov. 11 mos.	8,772	109,596,422	18,848,724	138,812,940	13,044,872	22,707,466	3,459,479	51,744,623	100,189,032	100,189,032	100,189,032	100,189,032	100,189,032
Texas & New Orleans.....Nov. 11 mos.	4,429	3,519,207	280,532	4,082,282	388,806	665,569	118,989	1,265,274	2,699,729	2,699,729	2,699,729	2,699,729	2,699,729
Spokane, Portland & Seattle.....Nov. 11 mos.	946	6,547,918	511,477	7,631,095	990,234	889,451	101,202	2,678,460	4,975,037	4,975,037	4,975,037	4,975,037	4,975,037
Tennessee Central.....Nov. 11 mos.	286	202,128	4,468	219,619	36,180	35,257	6,098	76,776	163,903	163,903	163,903	163,903	163,903
Texas & Pacific.....Nov. 11 mos.	286	2,108,840	57,945	2,296,458	394,343	32,827	63,759	750,416	1,639,510	1,639,510	1,639,510	1,639,510	1,639,510
Texas Mexican.....Nov. 11 mos.	162	88,305	1,613	99,789	17,909	16,791	3,776	37,739	83,590	83,590	83,590	83,590	83,590
Toledo, Peoria & Western.....Nov. 11 mos.	239	2,180,418	68	2,214,690	551,997	139,561	185,414	533,600	1,391,026	1,391,026	1,391,026	1,391,026	1,391,026
Union Pacific System.....Nov. 11 mos.	9,918	12,104,481	1,025,283	14,228,693	1,097,492	2,390,495	302,146	4,355,789	8,937,877	8,937,877	8,937,877	8,937,877	8,937,877
Utah.....Nov. 11 mos.	9,860	115,210,384	13,637,354	140,332,675	15,852,596	26,537,771	3,510,552	44,789,802	99,593,213	99,593,213	99,593,213	99,593,213	99,593,213
Virginian.....Nov. 11 mos.	619	1,541,291	3,159	1,600,999	119,998	266,601	21,290	244,071	681,398	681,398	681,398	681,398	681,398
Wabash.....Nov. 11 mos.	2,446	3,507,094	209,290	3,991,671	335,067	680,823	144,584	2,645,787	7,205,582	7,205,582	7,205,582	7,205,582	7,205,582
Ann Arbor.....Nov. 11 mos.	293	338,101	2,640	349,531	21,025	71,418	11,707	265,721	1,007,466	1,007,466	1,007,466	1,007,466	1,007,466
Western Maryland.....Nov. 11 mos.	882	1,389,355	6,133	1,389,604	189,048	242,057	35,587	324,102	840,548	840,548	840,548	840,548	840,548
Western Pacific.....Nov. 11 mos.	882	1,352,907	87,704	1,480,808	1,981,958	3,012,113	401,843	3,616,893	9,568,810	9,568,810	9,568,810	9,568,810	9,568,810
Wheeling & Lake Erie.....Nov. 11 mos.	1,207	1,281,089	18,775	1,333,688	133,804	257,890	57,405	1,007,466	511,140	511,140	511,140	511,140	511,140
Wichita Falls & Southern.....Nov. 11 mos.	203	44,163	47	48,651	8,872	13,507	1,549	15,743	42,982	42,982	42,982	42,982	42,982
	203	456,560	962	519,229	104,728	69,770	17,240	385,804	383,804	383,804	383,804	383,804	383,804